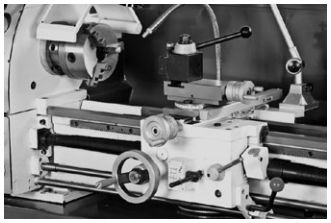
AXMINSTER Engineer SERIES

Code **505116**

CQ6230A-2/910
Metal Turning Lathe



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NOTE

This manual has been prepared for the owner and operators of this lathe. Its purpose, aside from machine operation, is to promote safety through the use of accepted correct operating and maintenance procedures. Completely read the safety and maintenance instructions before operating or servicing the machine. To obtain maximum life and efficiency from your lathe, and to aid in using the machine safety, read this manual.

Since we continually strive to incorporate latest developments in the construction of the lathe, it is quite possible at time, due to printing and shipping requirements, some data may not correspond to the lathe in the question.

LIMITED WARRANTY

We makes every effort to assure that our products meet high quality and durability standards and warrants to the original retail consumer/purchaser of our products that each product be free from defects in materials and workmanship as follow: 1YEAR LIMITED WARRANTY ON ALLPRODUCTS UNLESS SPECIFIED OTHERWISE. This Warranty dose not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, normal wear and tear or alterations outside our facilities, or to a lack of maintenance.

We shall in no event be liable for death, injuries to persons or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, the product or part must be returned to for examination, postage prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection discloses a defect, we will either or replace the product, or refund the purchases price if we cannot readily and quickly provide a repair or replacement, if you are willing to accept a refund. We will return repaired product or replacement at our expense, but if it is determined there in no defect, or that the defect resulted from causes not within the scope of our warranty, then the user must bear the cost of storing

and returning the product.

PASSPORT DATA

Model: _____ Serial No.: _____

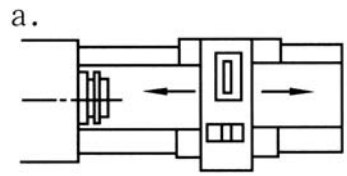
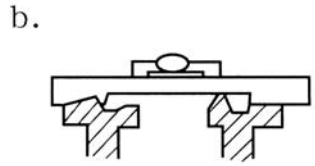
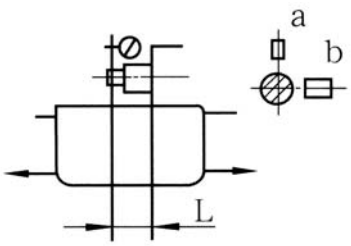
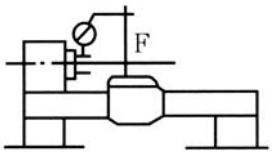
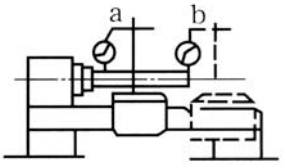
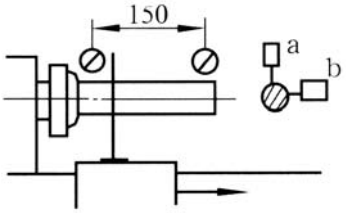
Main el. motor: _____ V _____ Ph _____ Hz

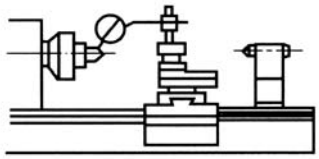
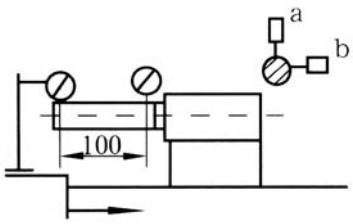
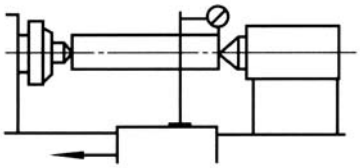
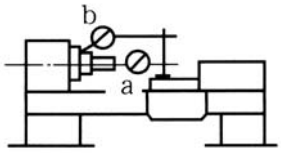
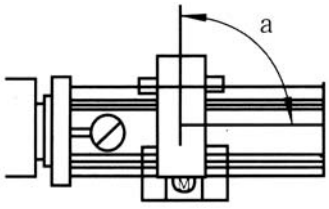
GEOMETRIC ACCURACY CHECKING

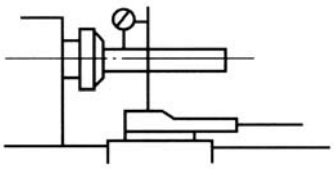
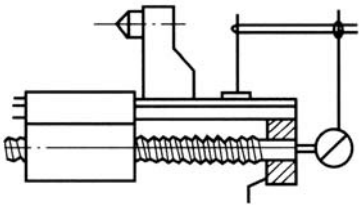
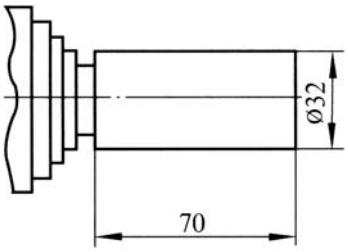
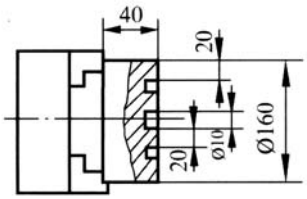
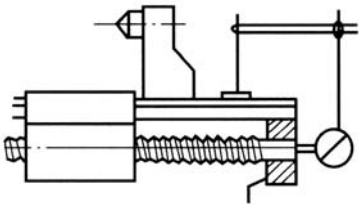
The machine lathe guide way horizontality shall be checked in longitudinal and transverse direction towards the machine axis by the help of level with an accuracy up to ±0.02/1000 mm and ± 0.04/1000 mm. before starting any accuracy measurement.

To avoid one-sided loading of the machine body, place the carriage in the center of the body while leveling.

TEST PROTOCOL

No.	Diagram of measuring method	Inspection item	Tolerance	Data
G1		a. Alignment of longitudinal bed slide ways in vertical place	Full travel 0.25 (+)	
		b. Parallelism of transverse direction	1000:0.06	
G2		Parallelism of tailstock to longitudinal motion of carriage. a. In vertical plane b. In horizontal plane	 a. 500:0.03 b. 500:0.025	
G3		Spindle nose run out	0.015	
G4		Spindle taper run out a. At the end of spindle nose b. At the end of 300mm test bar	 a. 0.01 b. 300:0.03	
G5		Parallelism of spindle center line to longitudinal motion of carriage a. In vertical plane (upward) b. In horizontal plane (forward)	 a. 300:0.02 b. 300:0.02	

No.	Diagram of measuring method	Inspection item	Tolerance	Data
G6		Spindle center run out	0.02	
G7		Parallelism of center line of tailstock spindle to longitudinal motion of carriage a. In vertical plane b. In horizontal plane	a. 200:0.03 b. 200:0.03	
G8		Difference in center height between headstock and tailstock (tailstock upward)	0.06	
G9		Spindle a. Axial run out b. Run out on spindle base plane	a. 0.015 b. 0.02 (axial run out included)	
G10		Verticality of cross slide to spindle center line	0.02/150 a ≥90°	

No.	Diagram of measuring method	Inspection item	Tolerance	Data
G11		Parallelism of top slide to spindle center line	0.04	
G12		Lead screw cam action	0.03	
G13		Accuracy of outside round cutting a. Roundness b. Cylindricity	a. 0.015 b. 300:0.04	
G14		Flatness of the face for finishing cutting (concave)	0.015 (for Ø 160mm)	
G15		Precisely thread cutting on work piece between tow centers (steel)	7g	

Date: _____ Supervisor: _____

1. GENERAL DESCRIPTION OF THE MACHINE

1.1. GENERAL DATA

MAIN ASSEMBLIES (See Fig. 1a)

1. Bed way
2. Headstock
3. Feed box
4. Carriage box
5. Electrical box
6. Chuck protecting cover
7. Splash guard
8. Lower carriage
9. Top carriage
10. Cooling
11. Working light
12. Tailstock
13. Leads crew (with Guard)
14. Feed rod
15. Switch rod
16. Tool holder
17. Quadrant
18. Oil tray
19. Steady rest
20. Foot stand
21. Thread indicator
22. Foot brake
23. 3 jaw chuck

CONTROLS (See Fig. 1b)

1. Lever for starting, stopping and reversing the carriage feed movement while threading
2. Lever for spindle speed stages
3. Wrench for the tool-holder
4. Flywheel for shifting the tool-holder slide
5. Handle for tail-spindle fixing
6. Handle for tailstock fixing
7. Flywheel for tail-spindle shifting
8. Handle for starting or stopping of the carriage longitudinal shifting while threading
9. Lever for starting the spindle in forward or reverse stroke and its stopping. When shift in forward direction, the spindle will turn counter-clockwise, and when shift in backward direction, the spindle will turn clockwise. When in the center position, the spindle stopped.
10. Lever starting and stopping the carriage transverse and longitudinal shifting.
11. Flywheel for manual shifting of the carriage in longitudinal direction
12. Flywheel for feeding the cross slide
13. Drum (handle) for selection of "feed" or "thread"
14. Button-emergency stop
15. Switch-coolant pump
16. Button-test bottom for the main el. motor
17. Signal lamp. It glows when the main el. motor is switched on

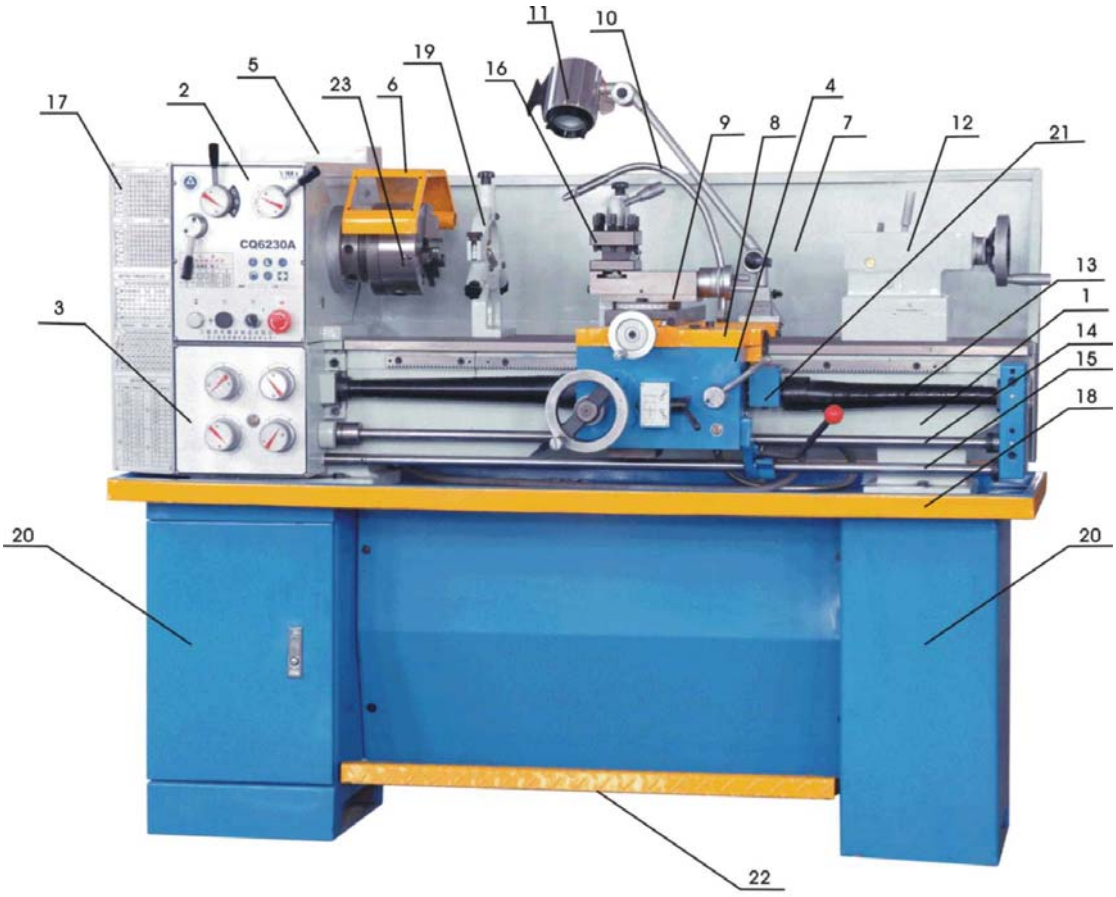


Fig.1a MAIN ASSEMBLIES

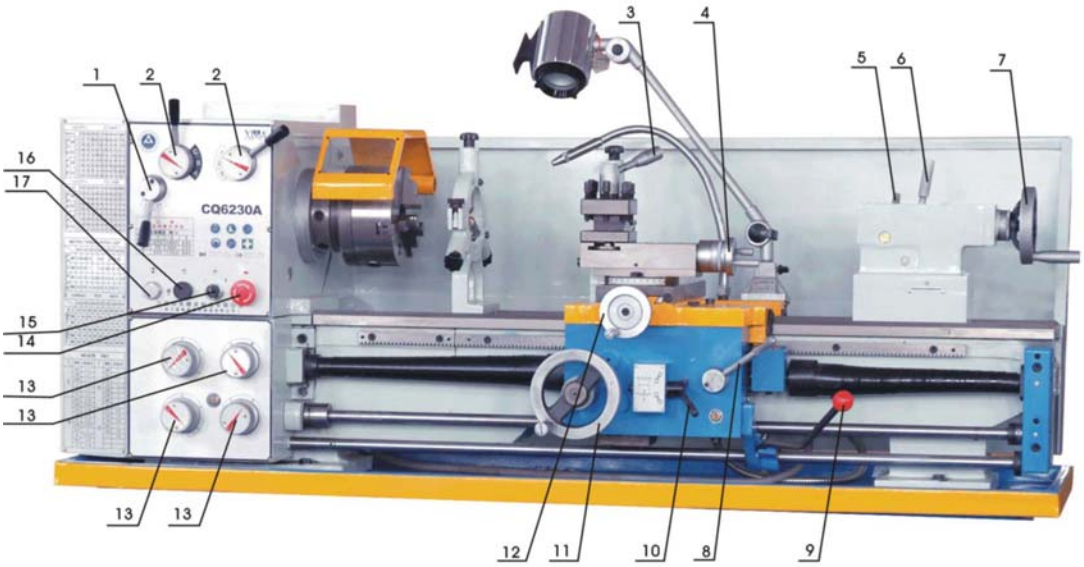


Fig.1b CONTROLS

1.2. BASIC TECHNICAL DATA

Form 1

	CQ6230 SERIAL	C0632C
Max swing over bed	Ø 300 mm	Ø 320mm
Max swing over gap	Ø 430 mm	Ø 450mm
Max swing over cross slide	Ø 180 mm	Ø 180mm
Distance between centers	900 mm / 750 mm	1000 mm
Taper of spindle bore	38 mm	
Range of spindle speed	9 steps 75—1400 rpm / 18 steps 65-1810 rpm	
Taper of spindle bore	M.T. 5	
Taper of tailstock spindle	M.T. 3	
Max. travel of carriage	760mm / 560 mm	880 mm
Max. travel of cross slide	130 mm	
Max. travel of top slide	75 mm	
Max. travel of tailstock spindle	100 mm	
Motor power	1.1 KW / 1.5 KW	

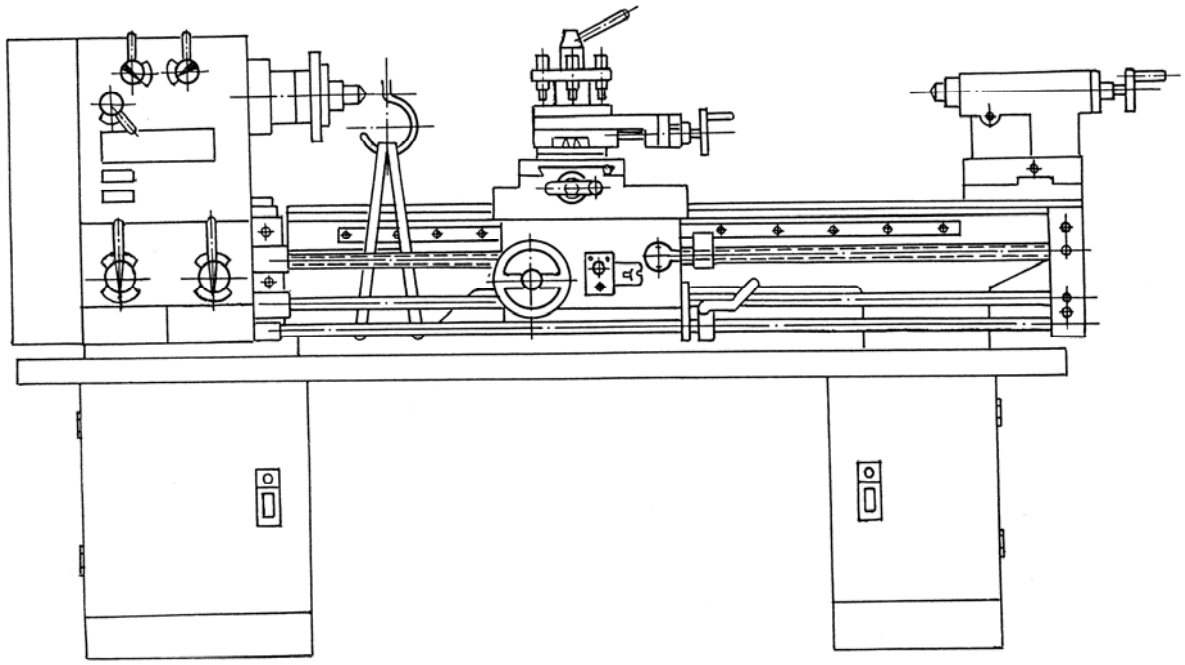


Fig.2 Position to hoist the lathe

2. DESCRIPTION OF THE MAIN UNITS

GEAR BOX

The gear box is mounted on the machine corp. the rotation motion to this gear box is transferred through V-belts and belt pulley from an el. motor mounted on the guide way.

QUADRANT

The quadrant is destinated to transfer the motion from the gear box to the feed box through some change gears. It is mounted in the quadrant box. The latter is closed by a cover.

FEED BOX

The feed box is fixed to the face side of the machine corp.—just below the gear box. It includes all the mechanisms, by the help of which is effected the adjustment for selection of the feed or thread pitches.

Required adjustments for the different values of the feed or thread pitch are realized by the help of respective drums, located on the front part of the feed box.

CARRIAGE GROUP AND ITS MECHANISMS

The carriage group is destinated for fixing and driving the cutting too. It includes five basic parts: carriage box, carriage board, lower slide, cross piece and upper (top) slide.

A. Carriage box

The carriage box is mounted on the carriage board. It contain the mechanisms that are used for driving the carriage longitudinal and cross feed, as well as the mechanism for engagement of the nut to the lead-screw while threading and the mechanism for manual feed of the carriage.

B. Carriage board

The carriage board is mounted on the corp. guide ways. All the rest parts of the carriage group are fixed to this carriage board.

C. The lower slide moved on the guide ways of the carriage board in

transverse direction. This movement may be effected automatically or manually.

D. When short cones have to turned by hand, the cross piece may be swiveled at 90° towards the lower slide in both directions and be fixed in the required position by the help of suitable bolts and nuts.

E. The top slide on which the four-position tool holder is mounted, may be shifted only by hand in the direction of the cross-piece.

Thus you may obtain longitudinal, cross and combined feed for the cutting tool.

THREAD-INDICATOR

This device is mounted to the carriage box (disengaged to the driving screw) for getting into thread pitch

TAIL STOCK

The tailstock is clamped to the corp. guide ways. It is designed for working piece clamping during machining between centers for drilling operations with manual feed of the tool.

RESTS

In response to the special request of the client, the lathe may be competed additionally with a steady and a follow rest.
The two types are with sliding quills. The steady rest is fixed to the corp. guide ways and the follow rest to the carriage board.

3. MACHINE INSTALLATION

TRANSPORTATION

The machine is transported in a special wooden case (or with foot stands separately packed in carton), being fixed to the base of the case or slide by suitable bolts. Some of the accessories are mounted on the lathe well fixed and the other packed in a separate box or directly fixed on the case base.

The places where the ropes or chains have to be passed during handling of the packed machine are marked on the packing. Be aware of the heavy side while you are handling the machine with forklift.

UNPACKING

After the machine had been unpacked, check carefully its general condition, as well as the availability and condition of all the accessories, shown in the packing list.

HANDLING

Unpacked machine shall be handled only by the help of a suitable crane. Before passing the ropes over the specified places, shown on the Fig.2, pull out the tailstock and carriage and fix them in the rear hand position so that when lifting the machine you will obtain required balancing. When handling the machine never strike or hit it sharply because this may affect the machine accuracy—irrespective of whether there are or not may visible defects.

Since the paint on some part of the machine may be damaged during handling, place protective pads of fabrics or other suitable material on the respective places.

PREPARATION

Before mounting the machine on the predetermined place, clean it carefully from the protective oil. Respective machine surface shall be washed by the help of pure naphtha or benzine.

This protective oil shall not be removed by hard objects or solvent that may damage the metal surface or paint of the machine. Well-cleaned surfaces are dried by the help of dry threads and covered with pure machine oil. Remove the end gear cover. Clean all components of the end gear assembly and coat all gears with heavy, non-slinging grease.

MOUNTING, FOUNDATIONS AND LEVELLING

To obtain accurate, durable and trouble-free operation of the machine, mount it only on suitable, foundation and level it carefully. The foundation is prepared

by concrete with a thickness from 200 to 300 mm according to the soil strengthness.

The unpacked machine is lifted by crane according to the specified method and after the anchor and leveling bolts are in place, lower the foundation so that the anchor bolts enter into the respective holes. The leveling plates (shims) are placed below the leveling bolts. The guide way horizontality is checked in longitudinal and transverse direction towards the machine axis by the help of level with an accuracy of ±0.02/1000 mm and ± 0.04/1000 mm. After this initial machine leveling had been carried out, pour the holes for the anchor bolts and the space blew the machine legs with cement putty with ratio between the cement and sand 1:3

After the cement is setted well (3-4days), tighten the nuts of the anchor bolts carefully and evenly.

Check the machine leveling once again and if necessary—correct it by the help of the leveling bolts.

CONNECTION TO THE EL. SUPPLY SOURCE

Check whether the data on the el. panel scheme (voltage and frequency of the supply source) correspond to the available.

The controlling level should remain in the middle and also press down the switch to keep the machine power off.

Make sure the lathe in properly grounded.

PUTTING INTO OPERATION

Before starting the machine, clean it once again carefully and lubricate it according to the Fig. 3a 3b 3c –Lubrication System.

Check the V-Type belt, which located from motor to the low speed wheels, whether it's too tight or not. Too tight belt will spoil the bearings, also, if the V-Type belt is too lengthened, it will skid, so the belt must be adjusted

Starting is effected in the following order:
Check manually the movement of all mechanisms. It shall be smooth. Check also the operation of all the controls.

Fill the tank of the cooling system with the specified coolant (optional accessory to be ordered separated). Switch on the main el. motor.

After one-hour operation of the machine, check the oil level in the tanks and if necessary add the required quantity.

After two shifts operation of the machine, check the play of the V-belts.

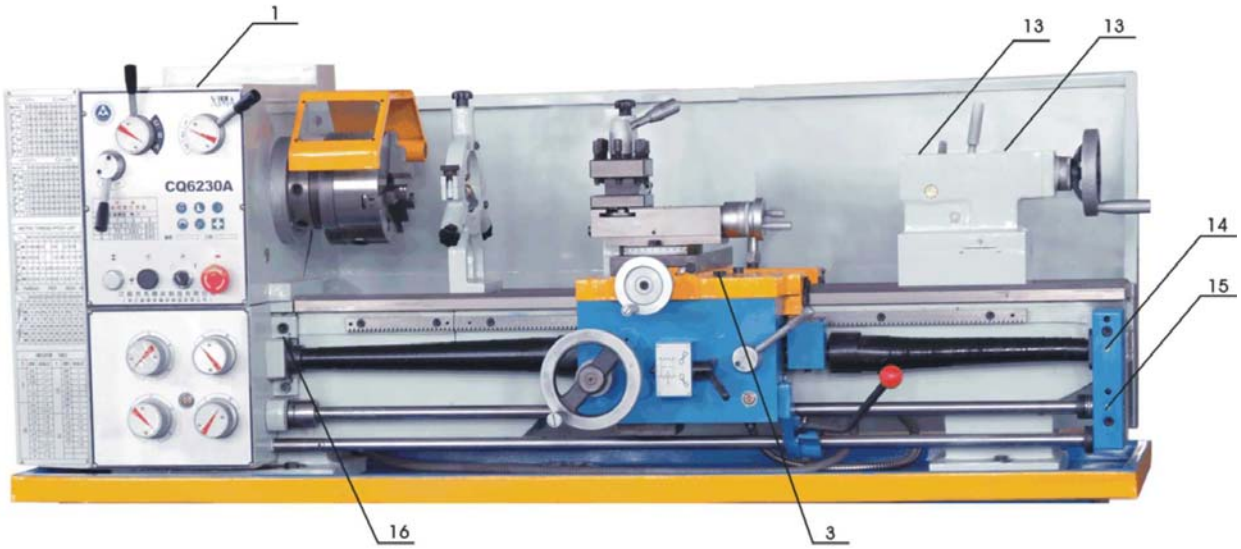


Fig.3a Lubrication System

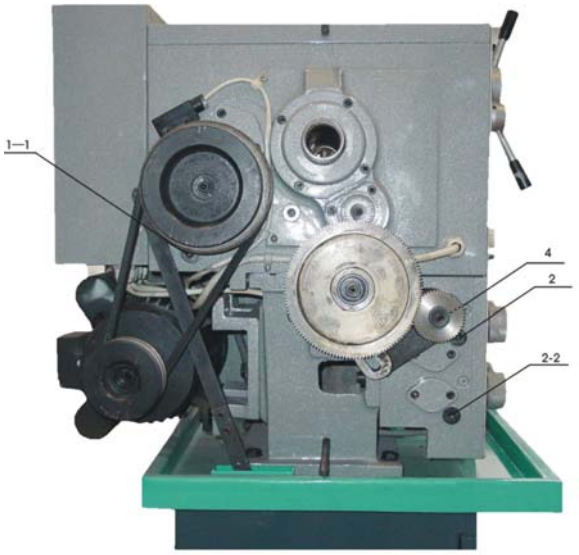


Fig.3b Lubrication System

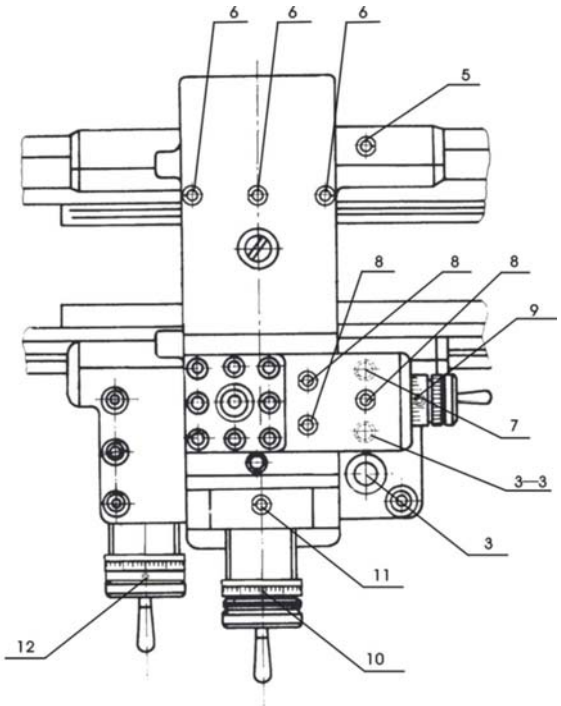


Fig.3c Lubrication System

4. MACHINE SERVICE

LUBRICATION

The trouble-free operation on the lathe depends on its careful servicing. Of special importance is the regular lubrication of all machine-operating parts with the recommended lubricants. These lubricants are listed in the Fig. 3a 3b 3c –Lubricating System.

The headstock (see Fig. 3a 3b 3c) is lubricated by the splash in of the oil, charged in it. The oil may be poured into after removal of the cap from the combined oil vent with oil filler. (p.1), located in the headstock cover. The oil draining by unscrewing the plug (p.1--1) to the oil draining tube. If the oil has to be replaced, clean the headstock with pure naphtha carefully. While charging new, its level must be to the middle of the oil sight glass. The disk couplers and the main spindle front bearing are lubricated by an oil-collecting groove.
The feed box is charged oil through a hole (p.2), located in its l. h. side (III type feed box) and r. h. side (I & II type feed box) (viewed frontally). The oil quantity must be also such that its level reaches the middle of the sight glass. The oil drainage is effected through the plug (p.2--2).

The change gear sleeve for the quadrant shall be lubricated with grease once per day by the help of suitable oiler. The change gears shall be lubricated with oil once per shift.

The carriage box is lubricated through a common hole (p.3), wherefrom the oil is fed into a tank which is also common for the whole box. By suitable grooves the oil is fed further to the respective bearing as a portion of it drops on the bottom of the box, from where the gears are oiled. The oil is drained through a plug (p.3--3).

The carriage as well as the slide-guiding surface are lubricated by the help of suitable oilers (p.6), pressed into the carriage and cross slider (p.8). The el. motor bearing shall be cleaned well and filled with new grease once per six months. All the friction surfaces of the carriage, traveling stock and conic lineal shall be oiled by the help of an oil-holder or oiler according to the lubricating system. The lubricating points are marked in the Fig. 3a 3b 3c –Lubrication System.

RECOMMENDED LUBRICANTS

For normal and other climatic conditions Form 2

Assembly	Lubricating point	Lubricating method	Lubricant	Lubricating interval
Headstock	Gears and bearings. Spindle front bearing. Spindle rear bearing. Belt pulley bearing	Oil bath—by splashing	Machine oil	Oil replacement: --for the first time—after 10 days operation of the lathe—for the second time—after 20 days operation of the lathe—next time—once per each 60 days
Feed box	Gears, bearing and all the mechanisms	Oil bath—by splashing	Machine oil	
Carriage	Gears, bearing and all the mechanisms	Oil bath—by splashing	Machine oil	
Quadrant	Changes gears Quadrant idle axle	By hand	Machine oil Grease "L"	Once per shift Once per shift
Carriage slide	Corp bed ways Slide bed ways	By hand with help of oilers	Machine oil	Once per shift
Cross carriage	Support of the screw in the slide. Cross screw for carriage	By hand oil tank, located in the carriage	Machine oil	Once per shift
Cross-shaped carriage	Carriage bed ways. Cross-shaped carriage bed ways. Screw of the cross-shaped carriage. Tool-holder	By hand	Machine oil	Once per shift
Tailstock	Screw support quill	By hand	Machine oil	Once per shift
Console	Lead screw bearing Feed rod bearing Switch rod bearing	By hand	Machine oil	Once per shift

5.MACHINE OPERATION

PUTTING INTO OPERATION

After performing the previous instruction, the machine is ready for operation, the connection to the el. supply source is effected by the help of the main interrupter. Turning on of the control lamp shows that the machine is connected to the el. supply circuit.

All the speed within the range 75—1400 rpm (65—1810 rpm) at different position of the levers are shown on Nameplate.

When starting the machine, check carefully whether all the gears are well engaged

This is obtained by placing the handles at their fixed positions.

THE CHANGE-OVER OF THE GEARS SHALL BE EFFECTED ONLY UNDER IDLING CONDITIONS.

The machine operating mode selection shall be realized from the speed indication nameplate.

When trying the machine, put the speed change lever in low speed stage and keep the machine running for at least 20 minutes, then gradually change the speed of the spindle up to fastest, every stage running over 5 minutes.

CUTTING OF THREADS AND FEEDS

The feed box receives its motion from shaft V of the gearbox through a set of change gears. If the handle 3 (Fig. 4. 5. 6) is placed in its r.h. position, the lathe is set for cutting of r.h. thread. If the same handle is placed in its l.h. position, the lathe is set for cutting of l.h. threading.

It is not required to place on the quadrant respective change gear set in order to prepare the lathe for necessary feed.

The different values for feeds and threads are obtained by the different setting of the quadrant and changing the position of drums / handle 4, 5, 6, 21 and handle 3.

All the quadrant setting and drums / handle different position are shown in nameplate for threads and feeds.

I & III TYPE FEEDBOX:

Select handle 4 for feeding or threading. Handle / drums 5,6,21 are for controlling the speed of feedbox.

II TYPE FEEDBOX:

Push handle 4 inside then move left or right to select feeding or threading, drawing back then move left or right for controlling the feed rate and size of the threads. Same operation on Handle 5 for the controlling the feed rate and size of the threads.

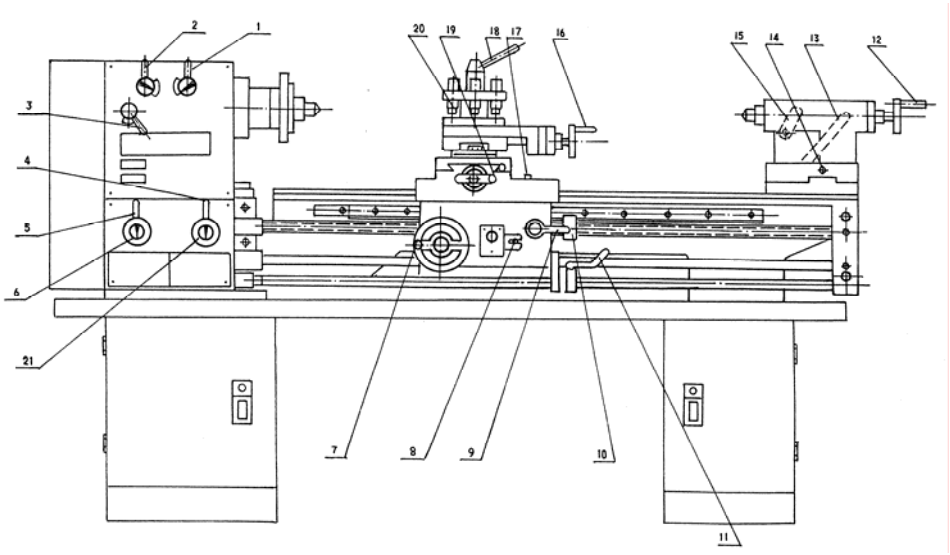


Fig.4 Operation levers I type Feedbox

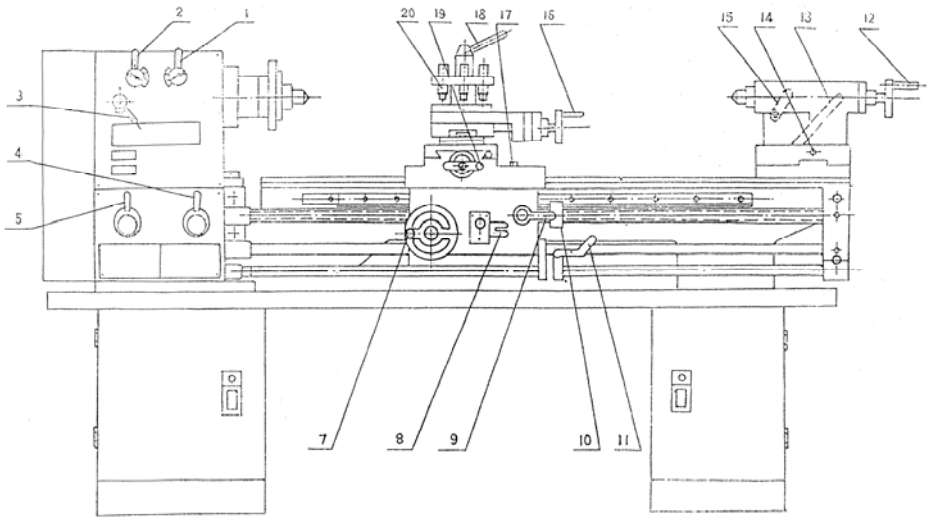


Fig. 5 Operation levers II type Feedbox

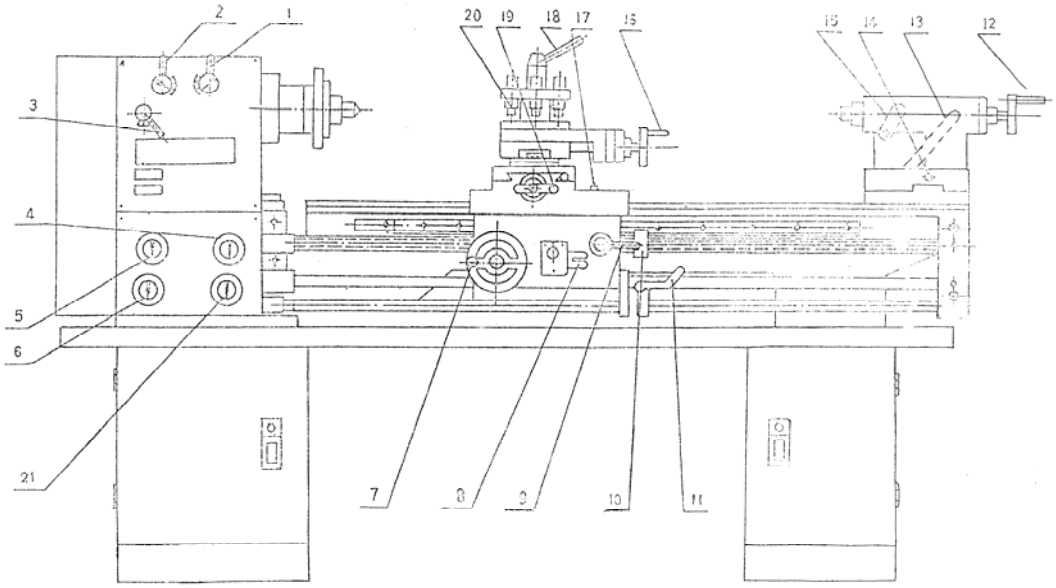


Fig. 6 Operation levers III type Feedbox

Adjust the nut gap on the carriage see Fig. 7. Rotate the p.1 on the nut to satisfied saddle moving and required travel.

Chuck and faceplate mounting see Fig. 8. The connection between spindle and chuck or faceplate is made by D-Cam lock structure. When mounting, put the three pull pins of chuck or faceplate into the three holes on the spindle face end, then turn the three cams with the aid of square head wrench, when turning the cams clockwise, the chuck or faceplate will be locked, when turning the cams counter-clockwise to certain point, the chuck or faceplate can be detached.

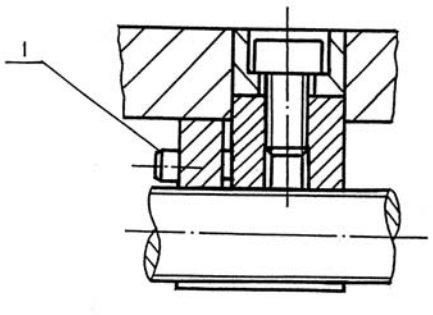


Fig. 7 Adjust the gap of horizontal feeding nut

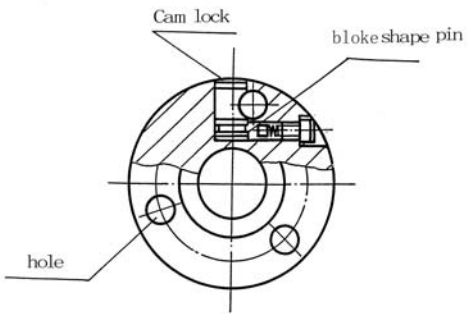


Fig. 8 Chuck or face plate lock structure

FRETTED PARTS

Form 3

NO.	Name	Material	Mount	Note
1	Feeding nut	ZQSn6-6-3	1	CQ6230-5104
2	Half nut	ZQSn6-6-3	1	CQ6230-4003

2.

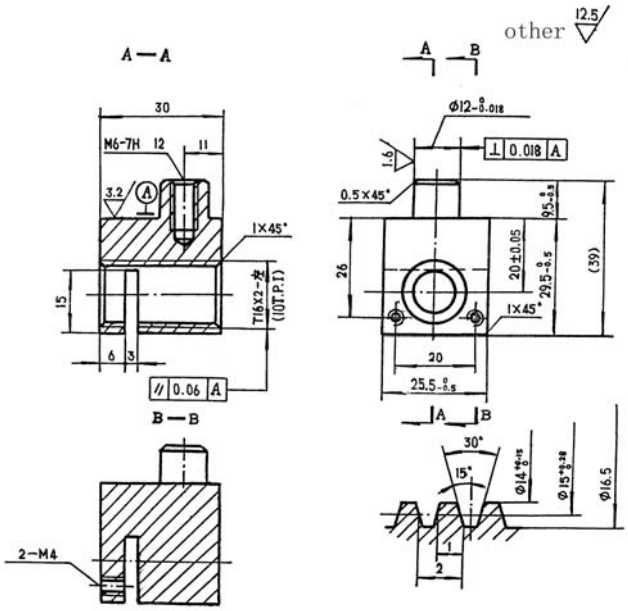


Fig.9 Feeding Nut Material

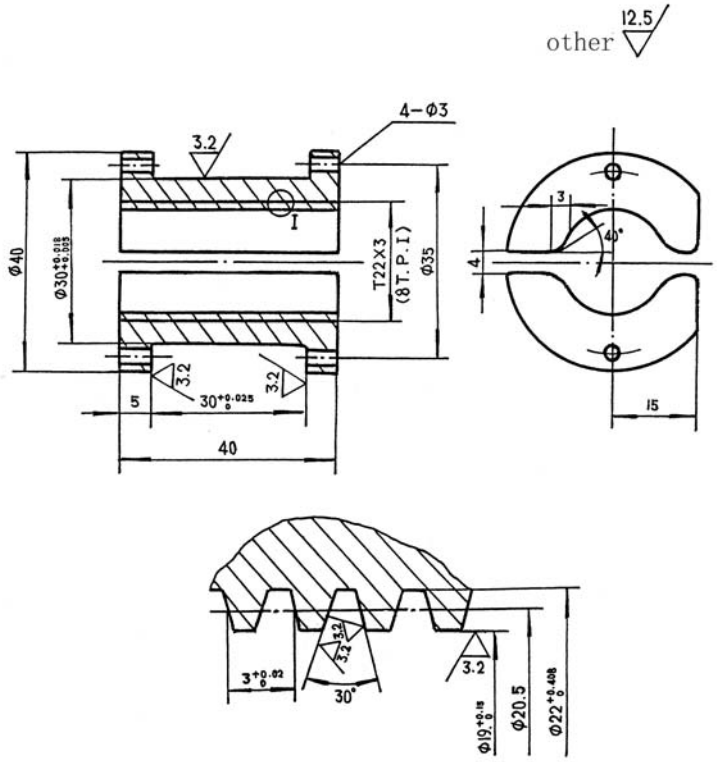


Fig.10 Half Nut Material

6. MECHANISM'S ADJUSTMENT

All the mechanisms are adjusted and tested in the producer's plant. After a prolonged exploitation, some of the mechanisms have to be readjusted because of the wearing off of the friction surfaces. The adjustment and setting of the different mechanisms shall be effected after each machine repair too. It is recommended these adjustments to be performed by qualified specialists in respective service.

7. SAFETY

All lathe operators must be constantly aware of the safety hazards that are associated with using the lathe and must know all safety precautions to avoid accidents and injuries.
Some important safety precautions to follow when using the lathe are:

1. Correct dressing is important, remove rings and watches, roll sleeves above elbows.
2. Always stop the lathe before making adjustments.
3. Do not change spindle speeds until the lathe comes to a complete stop.
4. Handle sharp cutters, centers, and drill with care.
5. Remove chuck keys and wrenches before operating
6. Always wear protective eye protection.
7. Handle heavy chuck with care and protect the lathe ways with a block of wood when installing a chuck.
8. Know where the emergency stop is before operating the lathe
9. Use pliers or a brush to remove chips and swarf, never your hands.
10. Never lean on the lathe.
11. Never lay tools directly on the lathe ways. If a separate table is not available, use a wide board with a cleat on each side to lay on the ways.
12. Keep tools overhang as short as possible.
13. Never attempt to measure work while it is running
14. Never file lathe work unless the file has a handle.
15. File left-handed if possible
16. Protecting the lathe ways when grinding or filing.
17. Use two hands when sanding the work piece. Do not wrap sand paper or emery cloth around the work piece.

8. MACHINE CARE AND MAITENANCE

Lathes are highly accurate machine tool designed to operate around the clock if properly operated and maintained. Lathes must be lubricated and checked for adjustment before operation. Improper lubrication or loose nuts and bolts can cause excessive wear and dangerous operating conditions.

1. The lathe ways are precision ground surfaces and must not be used as table for other tools and should be kept clean of grit and dirt.
2. The lead screw and gears should be checked frequently for any metal chips that could be lodged in the gearing mechanisms.
3. Check the lathe prior to operation for any missing parts or broken shear pins. Refer to the manual before attempting to lift the lathe.
4. Newly installed lathe should be properly leveled before any operation to prevent vibration and wobble.
5. When the lathe is transported out of a normal shop environment should be protected from dust, excessive heat, and very cold conditions.
6. Change the lubricant frequently if working in dusty conditions.
7. In hot working areas, use care to avoid overheating the motor of damaging any seals.
8. Operate the lathe ate slower speeds than normal when working in cold environments.
9. Lubricate all slide ways lightly before every using. The change gears and the leads crew must also be lightly lubricated with lithium base grease.
10. During the operation, the chips which falls onto the sliding surface should be cleaned timely, and the inspection should be often made to prevent chips falling into the position between the machine tool saddle and lathe bed guide way. Asphalt felt should be cleaned at certain time.
11. After the operation every day, eliminate all the chips and clean different part of the machine tool and apply machine tool oil to prevent rusting.
12. In order to maintain the machining accuracy, take care of the center, the surface of the machine tool for the chuck and the guide way and avoid mechanical damage and the wear due to improper guide.
13. If the damage is found, the maintenance should be done immediately.

ATTENTION: before performing any checking, repairing or maintenance operation, switch off the main switch and make an additional check to ensure that the machine is not under voltage.

Oil, grease and cleaning agents are pollutants and must not be disposed of through the drains or in normal refuse Dispose of those agents in accordance with current legal requirements on the environment. Cleaning rags impregnated with oil, grease and cleaning agents are easily inflammable. Collect cleaning rags or cleaning wool in a suitable closed vessel and dispose of them in an environmentally sound way-do not put them with normal refuse!

TRANSMISSION SYSTEM & PARTS (See Fig.11)

Form.4

Parts	Parts No.	Kinds	No. of teeth of thread	Modulus Of pitch	Pressure angle	Material	Notes
Headstock	1	Gear	42	M2	20°	45	2013
	2	Gear	23	M2	20°	45	2018
	3	Gear	47	M2	20°	45	2019
	4	Gear	36	M2	20°	45	2021
	5	Gear	55	M2	20°	45	2020
	6	Gear	31	M2	20°	45	2022
	7	Gear	45	M2	20°	45	2016
	8	Gear	58	M2	20°	45	2015
	9	Gear	21	M2	20°	45	2017
	10	Gear	45	M2	20°	45	2008
	11	Gear	59	M2	20°	45	2029
	12	Gear	46	M2	20°	45	2030
	13	Gear	83	M2	20°	45	2031
	14	Paired Gear	45	M2	20°	45	2026
			40	M2	20°	45	
	15	Gear	40	M2	20°	45	2032
			45	M2	20°	45	
Feed-box	16	Gear	24	M2.25	20°	45	3029B
	17	Gear	16	M2.25	20°	45	3031B
	18	Gear	18	M2.25	20°	45	3032B
	19	Triplicate Gear	18	M2.25	20°	45	3005B
			18	M2.25	20°	45	
			18	M2.25	20°	45	
	20	Gear	20	M2.25	20°	45	3003B
	21	Gear	28	M2.25	20°	45	3002B
	22	Gear	27	M2.25	20°	45	3027C
	23	Gear	21	M2.25	20°	45	3025C
	24	Gear	21	M2.25	20°	45	3018C
	25	Paired Gear	18	M2.25	20°	45	3026C
			30	M2.25	20°	45	
	26	Gear	22	M2.25	20°	45	3007C
	27	Paired Gear	15	M2.25	20°	45	3006C
			22	M2.25	20°	45	

Continuing

	28	Gear	23	M2.25	20°	45	3009B
	29	Gear	17	M2.25	20°	45	3016C
	30	Gear	15	M2.25	20°	45	3014C
Apron	31	Gear	11	M2.25	20°	45	4028
	32	Rack		M2.25	20°	45	
	33	Lead screw	Single thread	8T.P.lor 3mm	29° or 30°	45	
	34	Halfnut	Single thread			ZQSn6-6-3	
	35	Worm	Single thread	MS2	20°	45	
	36	Worm gear	24	MS2	20°	ZQSn6-6-3	4017
	37	Gear	15	M2	20°	45	4030
	38	Gear	50	M2	20°	ZQSn6-6-3	4029
	39	Gear	25	M2	20°	45	4014
	40	Nut	Single thread	10T.P.L.2mm		ZQSn6-6-3	Left hand tread
	41	Screw	Single thread	10T.P.L.2mm		45	
	42	Gear	14	M2	20°	45	4019
	43	Gear	51	M2	20°	45	4013
	44	Gear	43	M2	20°	45	5127
	45	Gear	25	M2	20°	45	4010
	46	Gear	48	M2	20°	45	4012
	47	Screw	Single thread	10T.P.L.2mm		45	
	48	Nut	Single thread	10T.P.L.2mm		ZQSn6-6-3	
Tail-stock	49	Rod screw	Single thread	10T.P.L.2mm		45	Left hand tread
	50	Nut	Single thread	10T.P.L.2mm		ZQSn6-6-3	Left hand tread
Change gear		Gear	22	M1.25	20°		3076C
		Gear	24	M1.25	20°	45	2002C
		Gear	26	M1.25	20°	45	3075C
		Gear	44	M1.25	20°	45	3077C
		Gear	48	M1.25	20°	45	3039C
		Gear	52	M1.25	20°	45	3039C
		Paired Gear	127(120)	M1.25	20°	45	3078C

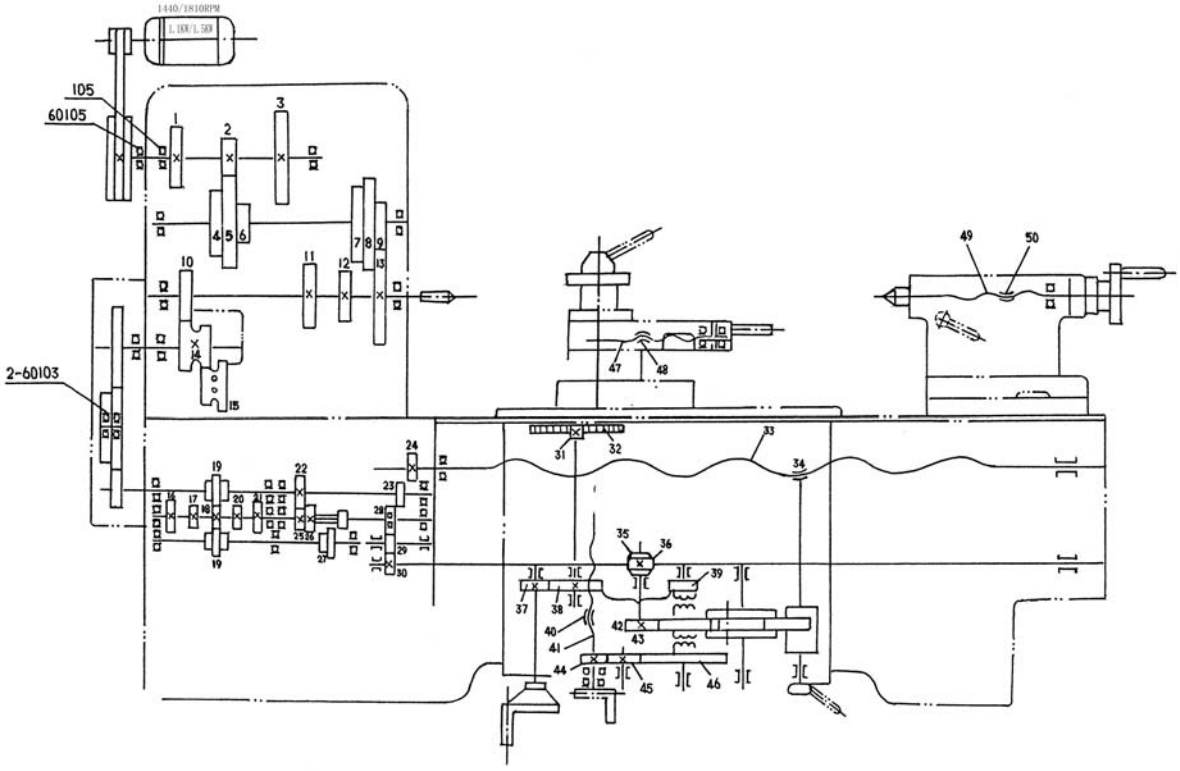


Fig.11 Transmission system

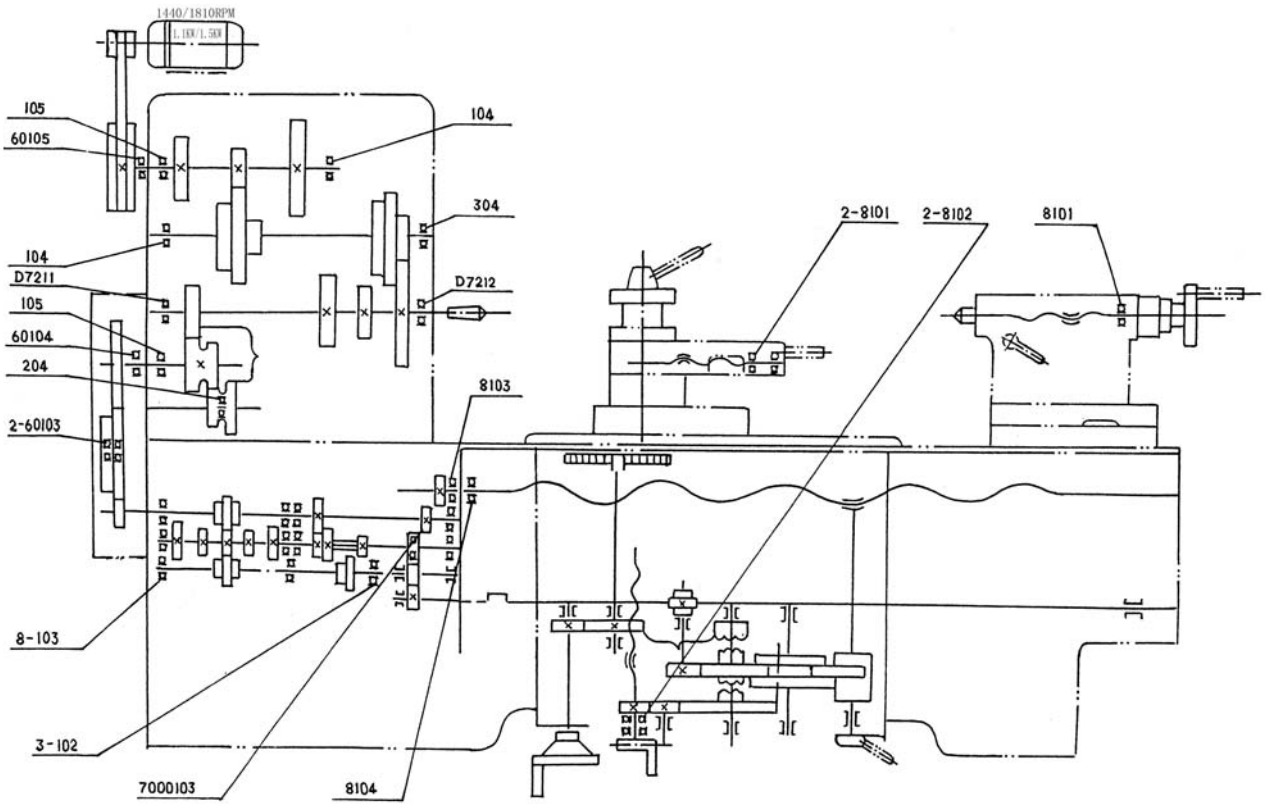


Fig.12 Bearings Distribution

BEARING DISTRIBUTION (See Fig.12)

Form 5

TYPE	Name	Specification	Qty	Installation
60104	Ball bearing single row	20×42×12	1	Headstock
60105	Single row ball bearing with shield	25×47×12	1	
304	Single row ball bearing with shield	20×52×15	1	
104	Single row ball bearing	20×42×12	2	
105	Single row ball bearing	25×17×12	2	
204	Single row ball bearing	20×47×14	1	
D7211	Single row taper roller bearing	55×100×22	1	
D7212	Single row taper roller bearing	60×110×22	1	
102	Single row ball bearing	15×32×9	3	Feedbox
103	Single row ball bearing	17×35×10	8	
7000103	Single row ball bearing	17×35×8	1	
8103	Single row pillow block bearing	17×32×8	1	
8104	Single row pillow block bearing	20×35×10	1	
8101	Single row pillow block bearing	12×26×9	2	Carriage
8102	Single row pillow block bearing	15×28×9	2	
8101	Single row pillow block bearing	12×26×8	1	Tail stock
60103	Single row ball bearing	17×35×10	2	Change gear

PARTS DRAWING

&

PARTS LIST

BE SUBJECT TO ALTERATION WITHOUT NOTICE

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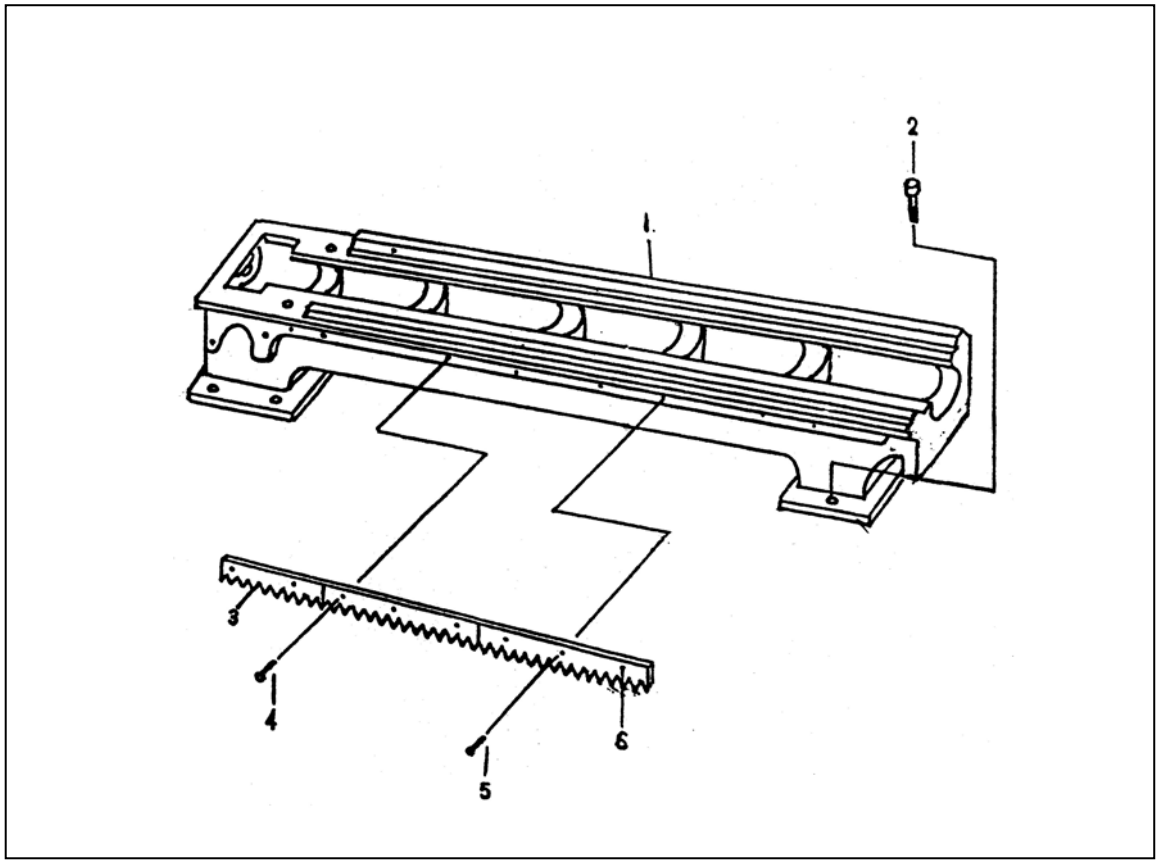
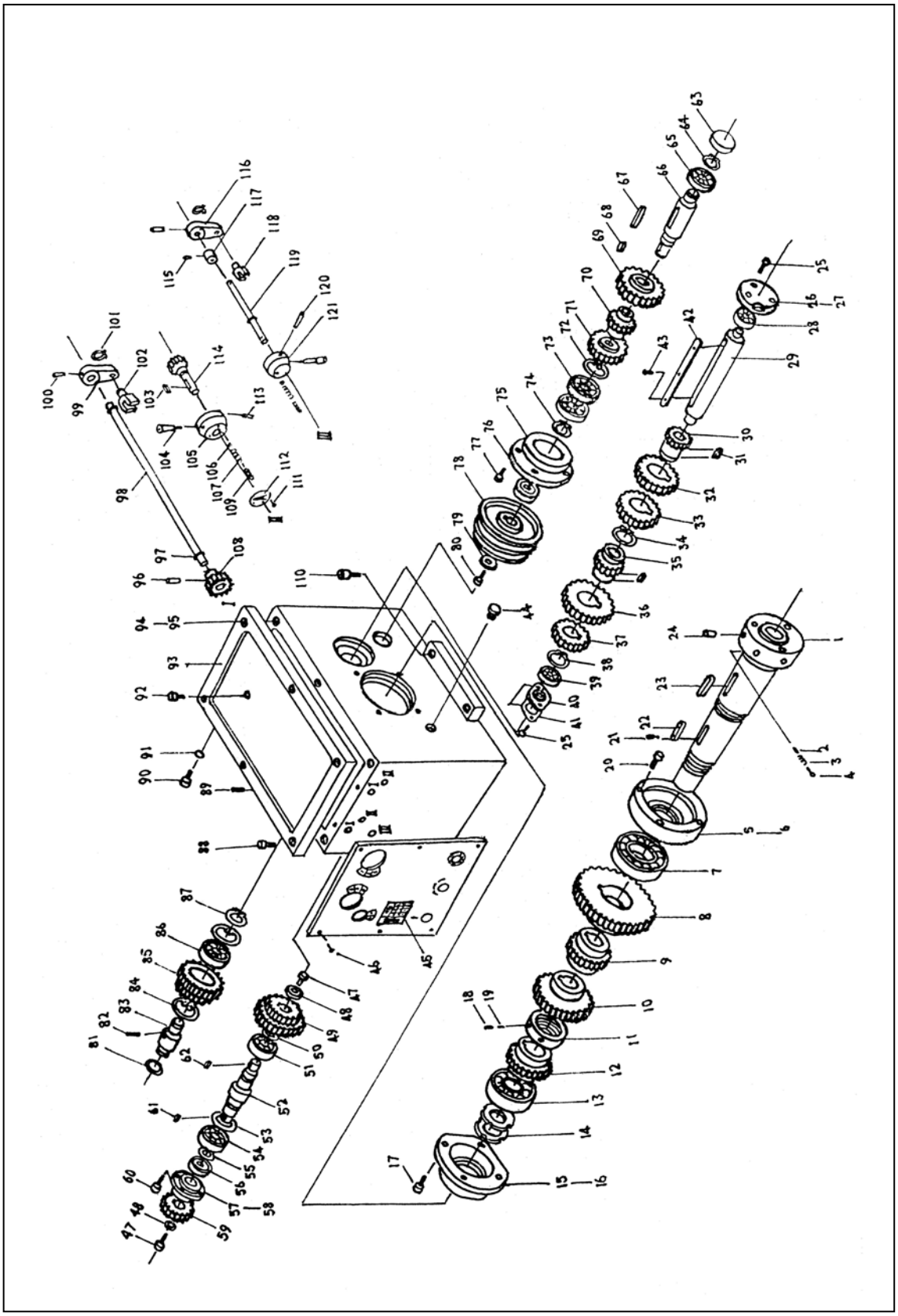
BED ASSEMBLY



BED ASSEMBLY							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Lathe bed	1	10047	4	Screw	6	M6×15
2	Screw	6	M12 ×40	5	Pin	6	5×20
3	Rack gear	1	1009	6	Rack gear	2	1011

HEAD STOCK

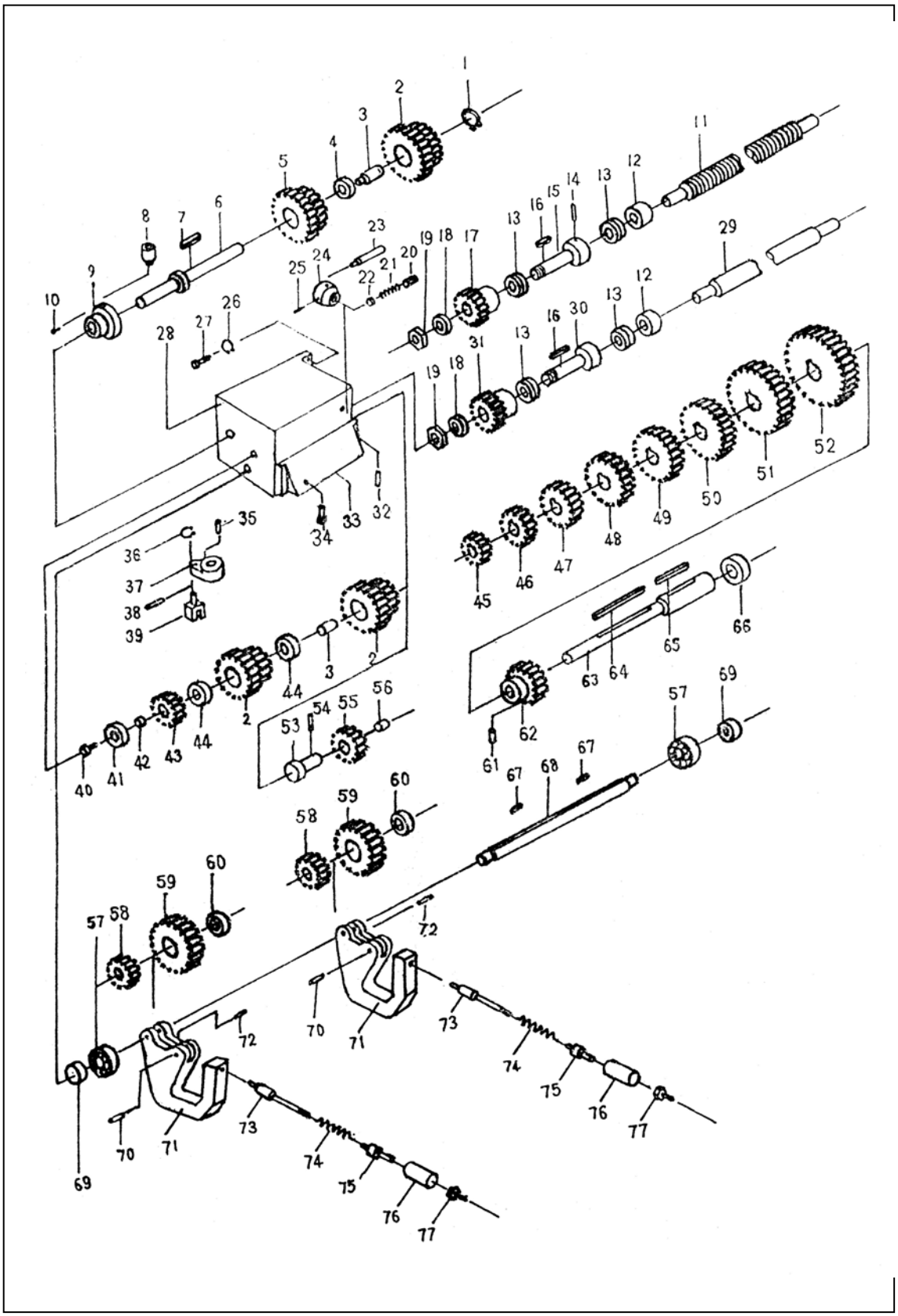


HEAD STOCK

No.	NAME	QTY	NOTE	No.	NAME	QTY	NOTE
1	Spindle	1	2034	34	Circlip	1	
2	Lock pin	3	2035	35	Gear	1	2022
3	Spring	3	0.6×4×22	36	Gear	1	2020
4	Screw	3	M8×16	37	Gear	1	2021
5	Cover	1	2038	38	Circlip	1	
6	Oil seal	1	2006	39	Bearing	1	6104
7	Bearing	1	D7212	40	Cover	1	2009
8	Gear	1	2031	41	Oil seal	1	2009A
9	Gear	1	2030	42	Key	1	8×108
10	Gear	1	2029	43	Screw	2	M3×8
11	Nut	1	2024	44	Oil seal	1	
12	Gear	1	2008	45	Fascia	1	2055
13	Bearing	1	D7212	46	Screw	6	M3×8
14	Nut	2	2007	47	Screw	2	M6×12
15	Cover	1	2005A	48	Washer	2	2003
16	Oil seal	1	2023	49	Gear	2	2026
17	Screw	4	M8×16	50	Circlip	1	25
18	Screw	2	M8×8	51	Bearing	1	
19	Collar	2	2025	52	Shaft	1	2027a
20	Screw	4	M8×16	53	Circlip	1	42
21	Screw	2	M3×8	54	Bearing	1	
22	Key	1	8×45	55	Circlip	1	20
23	Key	1	8×80	56	Oil seal	1	D20×40×10
24	Shaft	3	2037	57	Cover	1	2004A
25	Screw	5	M8×16	58	Oil seal	2	2066
26	Cover	1	2040	59	Gear	1	2002B
27	Oil seal	1	2028	60	Screw	3	M6×115
28	Bearing	1		61	Key	1	C5×8
29	Shaft	1	2039	62	Key	1	C5×20
30	Gear	1	2017	63	Cover	1	2063
31	Key	2	5×18	64	Circlip	1	
32	Gear	1	2015	65	Bearing	1	
33	Gear	1	2016	66	Shaft	1	2010B

No.	NAME	QTY	NOTE	No.	NAME	QTY	NOTE
67	Key	1	5×80	95	Headstock	1	2033
68	Key	1	C5×24	96	Pin	2	4×24
69	Gear	1	2019	97	Oil seal	7	16×2.4
70	Gear	1	2018	98	Shaft	2	2046
71	Gear	1	2013	99	Shaft arm	2	2042
72	Circlip	1	47	100	Pin	3	4×24
73	Bearing	2		101	Circlip	3	
74	Circlip	1		102	Shifter	2	2041
75	Cover	1	2012B	103	Key	2	5×16
76	Oil seal	1	D25×40×10	104	Handle	3	2058
77	Screw	4	M6×20	105	Boss	2	2059
78	Pulley	1	2014	106	Ball	4	
79	Washer	1	2011	107	Spring	4	1×6×20
80	Screw	1	M8**×20**	108	Gear	2	2047
81	Oil seal	1		109	Screw	4	M8×8
82	Screw	1	M6×8	110	Screw	2	M12×25
83	Shaft	1	2001	111	Screw	4	M3×6
84	Circlip	2	47	112	Fascia	2	2060
85	Gear	1	2032	113	Screw	2	M6×20
86	Bearing	1		114	Gear	2	2061
87	Circlip	1		115	Screw	1	M6×**8**
88	Screw	6	M6×30	116	Shift arm	1	2054A
89	Screw	2	M6×20	117	Collar	1	2079
90	Screw	1	M16×1.5	118	Shifter	1	2048
91	Oil seal	1	16×2.4	119	Shaft	1	2052
92	Screw	1	M16×1.5	120	Pin	1	5×40
93	Cover	1	2044	121	Boss	1	2051
94	Oil seal	1	2062				

GEAR BOX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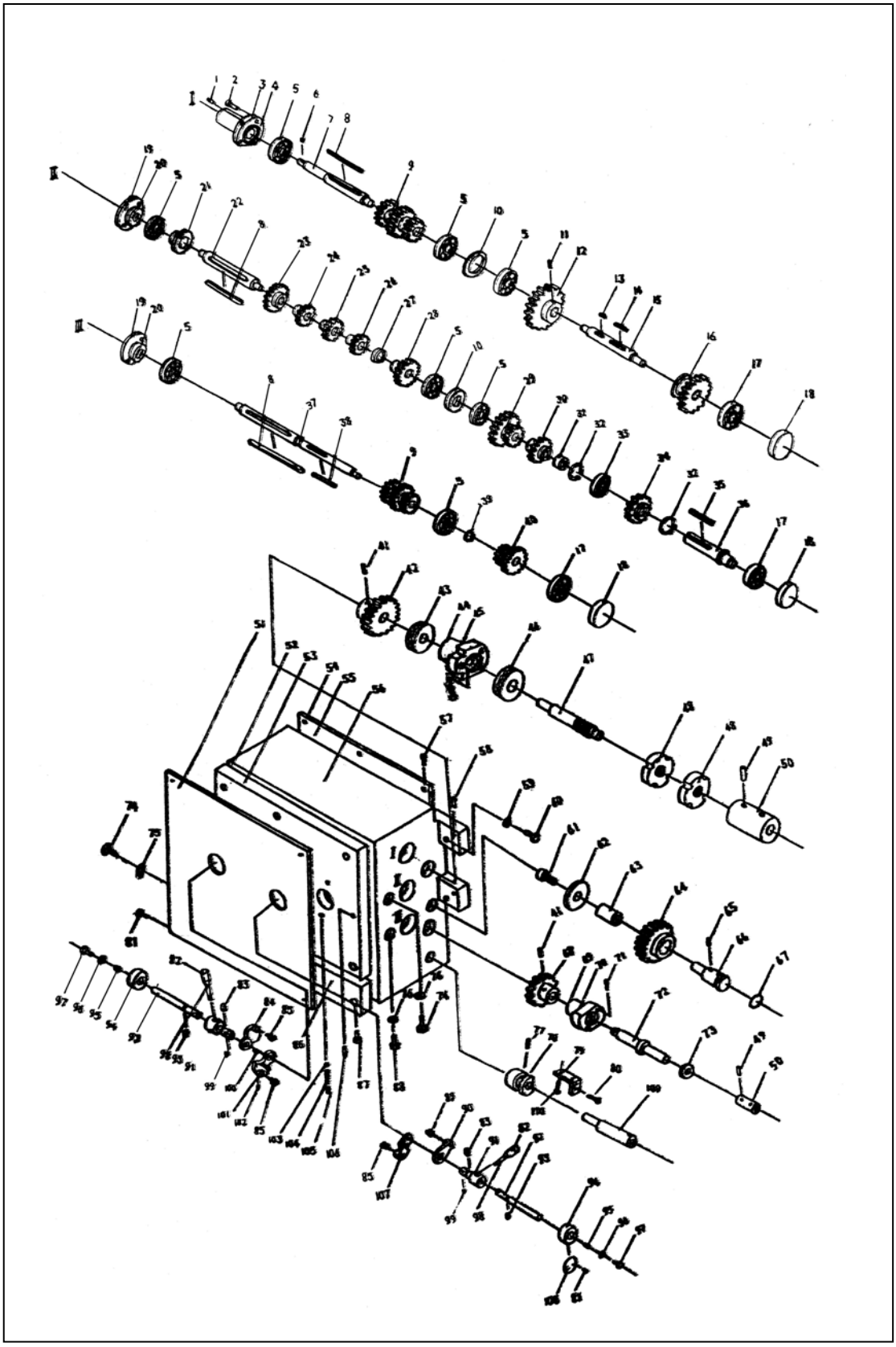
GEAR BOX

No.	NAME	QTY	NOTE.	No.	NAME	QTY	NOTE.
1	Oil Cup	1		21	Boss	1	2057
2	Circlip	1		22	Pin	1	5×40
3	Gear	3	3015	23	Gear Box	1	3001
4	Bushing	3	3016	24	Screw	3	M8×8
5	Washer	1	3024	25	Spring	2	1×4.5×7
6	Gear	1	3023	26	Sted Ball	2	
7	Shaft	1	3022	27	Screw	2	M10×30
8	Key	1	5×10	28	Spring washer	2	
9	Cover	1	3031	29	Feed Rod	1	1006
10	Screw	3	M6×16	30	Shaft	1	3047
11	Guide Screw	1	1005	31	Gear	1	3004
12	Sheath	2	3084	32	Plate	1	3029
13	Bearing	4	8103	33	Screw	4	M6×16
14	Pin	2	5×35	34	Shaft	1	3039
15	Shaft	1	3028	35	Circlip	1	
16	Key	2	5×14	36	Shifter Arm	1	3040
17	Gear	1	3026	37	Pin	1	5×30
18	Nut	4	M12	38	Shifter	1	3041
19	Washer	4	3025	39	Bushing	1	3019
20	Lever	1	6056	40	Screw	1	M6×12

No.	NAME	QTY	NOTE	No.	NAME	QTY	NOTE
41	Washer	1	3021	61	Pin	1	
42	Gear	2	3018	62	Gear	1	3027
43	Washer	2	3017	63	Shaft	1	3020
44	Gear	1	3012	64	Key	1	5×75
45	Gear	1	3011	65	Key	1	3042
46	Gear	1	3010	66	Top	1	3043
47	Gear	1	3009	67	Key	2	3014
48	Gear	1	3008	68	Shaft	1	3003
49	Gear	1	3007	69	Pin	2	5×18
50	Gear	1	3006	70	Top	2	3002
51	Gear	1	3005	71	Screw	2	M6×5
52	Gear	2	3044	72	Shaft	2	3051
53	Pin	4	6×25	73	Shaft	2	3054
54	Gear	2	3045	74	Spring	2	1×8×47
55	Bushing	1	3046	75	Sleeve	2	2053
56	Bearing	2		76	Housing	2	3055
57	Gear	1	3013	77	Nut	2	M6
58	Gear	2	3049				
59	Bushing	2	3050				
60	Shifter Lever	2	3052				

GEAR BOX- I

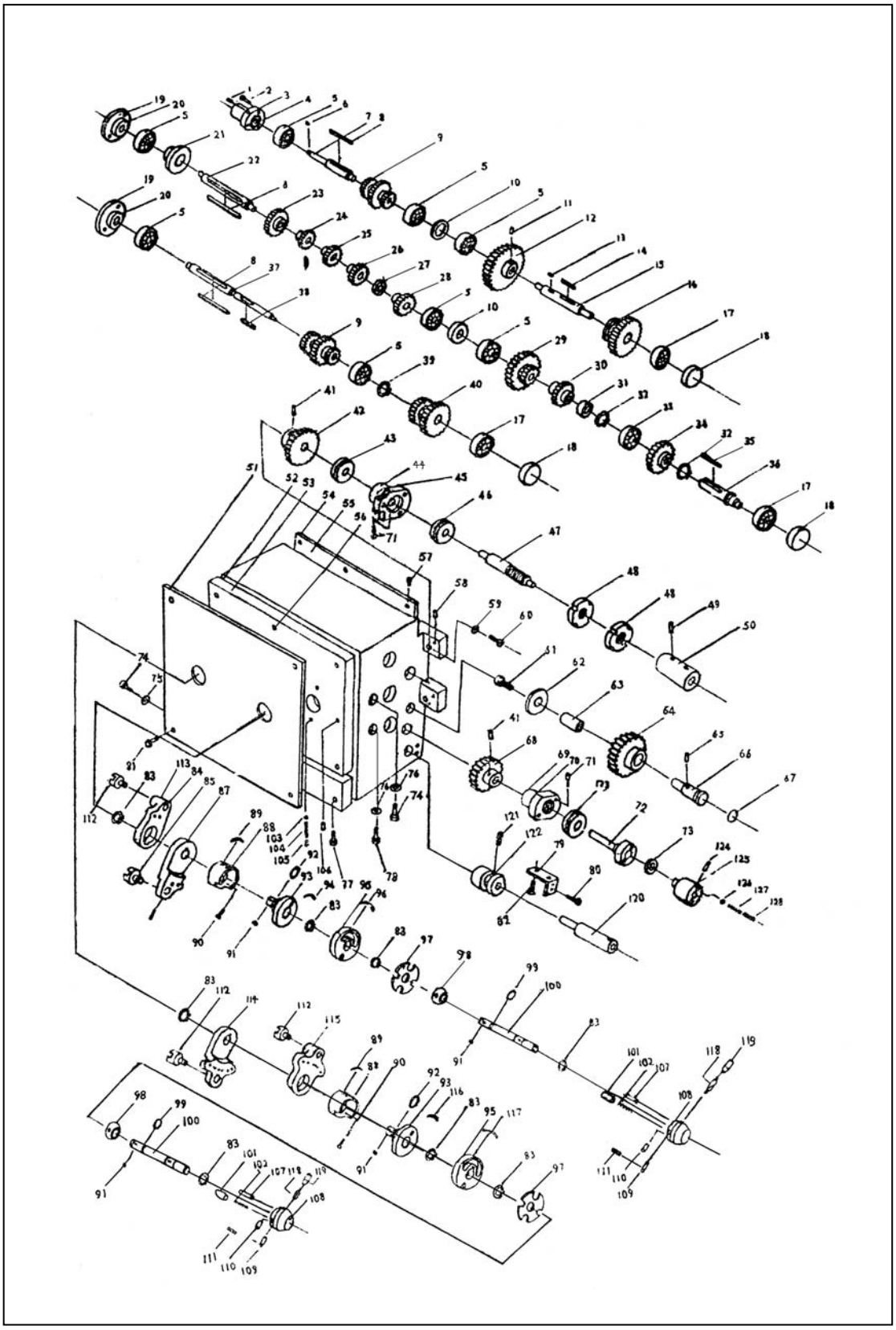


GEAR BOX- Ⅰ

No.	NAME	QTY	NOTE	No.	NAME	QTY	NOTE
1	Oil Cup	1		29	Gear	1	3026C
2	Screw	7	M6×12	30	Gear	1	3007C
3	Cover	1	3034B	31	Washer	1	3008C
4	Oil seal	1	3035C	32	Circlip	2	
5	Bearing	8		33	Bearing	1	
6	Key	1	5×13	34	Gear	1	3009B
7	Shaft	1	3041B	35	Key	1	C5×40
8	Key	3	6×90	36	Shaft	1	3019C
9	Gear	2	3005B	37	Shaft	1	3004B
10	Washer	2	3066B	38	Key	1	5×35
11	Screw	1	M6×8	39	Circlip	1	
12	Gear	1	3027C	40	Gear	1	3006C
13	Key	1	6×15	41	Pin	2	5×25
14	Key	1	6×35	42	Gear	1	3018C
15	Shaft	1	3067C	43	Bearing	1	8103
16	Gear	1	3025C	44	Cover	1	3084D
17	Bearing	3		45	Oil seal	1	3068D
18	Cover	3	3017B	46	Bearing	1	8104
19	Cover	2	3044B	47	Shaft	1	3021C
20	Oil seal	2	3046B	48	Nut	2	M20×1.5
21	Washer	1	3045B	49	Pin	1	5×25
22	Shaft	1	3033B	50	Bushing	1	3020D
23	Gear	1	3029B	51	Fasica	1	3060D
24	Gear	1	3031B	52	Oil seal	1	3071D
25	Gear	1	3032B	53	Cover	1	3059B
26	Gear	1	3003B	54	Cover	1	3042C
27	Washer	1	3030B	55	Oil seal	1	3070C
28	Gear	1	3002B	56	Gear box	1	3001C

No.	NAME	QTY	NOTE	No.	NAME	QTY	NOTE
57	Screw	6	M6×12	85	Shifter	3	3049B
58	Pin	2	5×25	86	Cover	1	3061B
59	Spring washer	2		87	Screw	8	M8×16
60	Screw	2	, 10×30	88	Oil window	1	
61	Screw	1	M6×12	89	Shifter	1	3062B
62	Washer	1	6×32×5	90	Shifter arm	1	3063B
63	Bushing	1	3024C	91	Boss	2	3057C
64	Gear	1	3016C	92	Shaft	2	3056C
65	Screw	1	M6×16	93	Oil seal	2	16×2.4
66	Shaft	1	3015C	94	Hand wheel	2	3054C
67	Oil seal	1	22×2.65	95	Key	2	5×8
68	Gear	1	3014C	96	Washer	2	
69	Cover	1	3022F	97	Screw	2	M6×10
70	Oil seal	1	3086D	98	Lever	2	3051C
71	Screw	5	M6×25	99	Key	2	5×8
72	Shaft	1	3013E	100	Pin	1	
73	Oil seal	1	25×40×10	101	Shifter arm	1	3058C
74	Screw	2	M16×1.5	102	Screw	4	M3×6
75	Washer	2		103	Ball	4	Ø15
76	Oil seal	2	16×2.4	104	Spring	4	1×5×14
77	Screw	1	M6×10	105	Screw	4	M8×5
78	Position piece	1	3012E	106	Pin	2	M5×25
79	Support	1	7003C	107	Shifter arm	2	3065C
80	Screw	2	M4×20	108	Sign board	2	2060
81	Screw	8	M8×16	109	Shaft	1	3011D
82	Knob	2	M8×40	110	Screw	2	M4×40
83	Oil seal	2	25×2.65				
84	Shifter Arm	1	3053B				

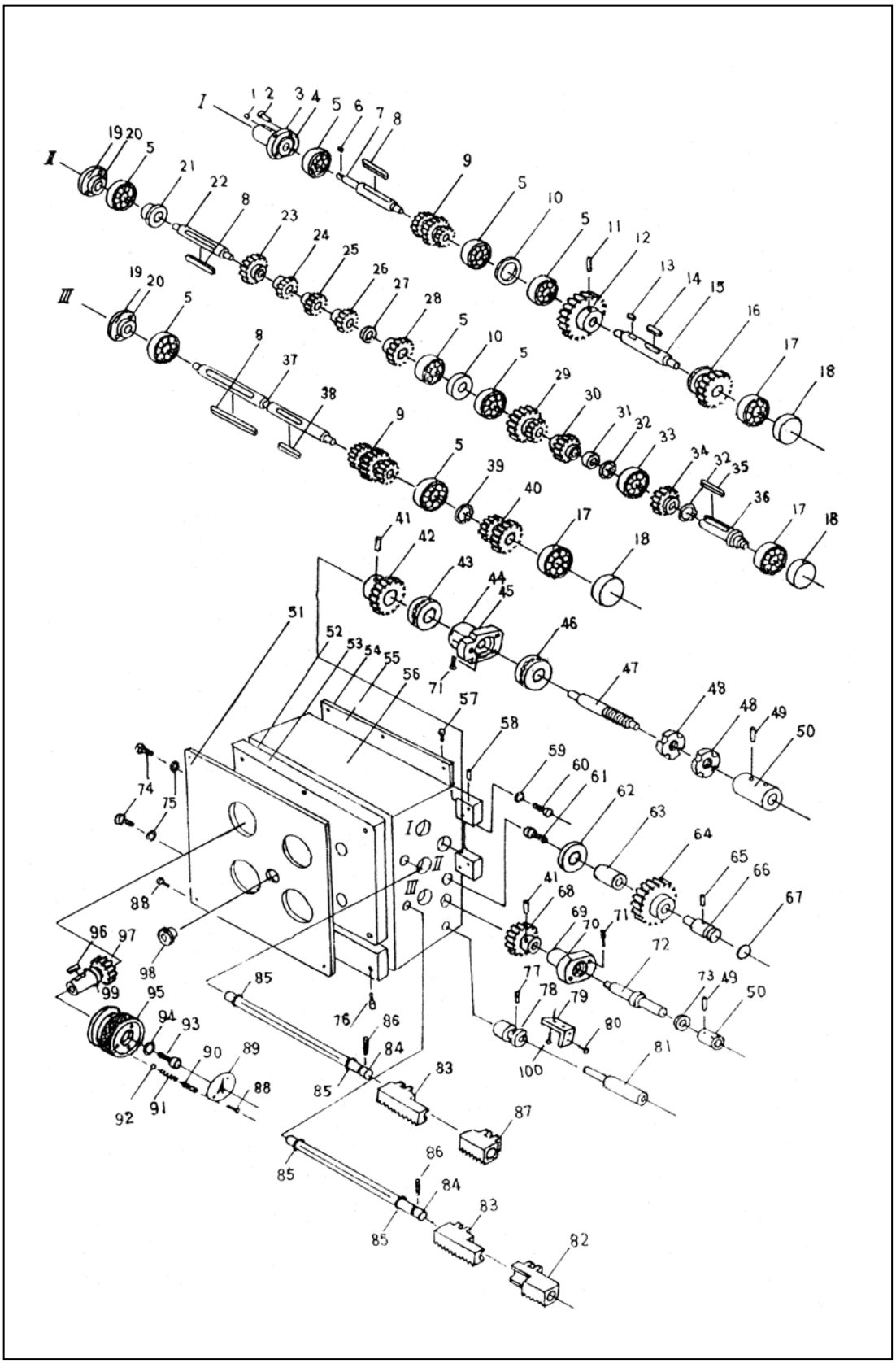
GEAR BOX- II



GEAR BOX-Ⅱ							
No.	NAME	QTY	NOTE	No.	NAME	QTY	NOTE
1	Oil Cup	1		33	Bearing	1	
2	Screw	7	M6×12	34	Gear	1	3009B
3	Cover	1	3034B	35	Key	1	C5×40
4	Oil seal	1	3035C	36	Shaft	1	3019C
5	Bearing	8		37	Shaft	1	3004B
6	Key	1	5×13	38	Key	1	5×35
7	Shaft	1	3041B	39	Circlip	1	
8	Key	3	6×90	40	Gear	1	3006C
9	Gear	2	3005B	41	Pin	2	5×25
10	Washer	2	3066B	42	Gear	1	3018C
11	Screw	1	M6×8	43	Bearing	1	8103
12	Gear	1	3027C	44	Cover	1	3084D
13	Key	1	6×15	45	Oil seal	1	3068D
14	Key	1	6×35	46	Bearing	1	8104
15	Shaft	1	3067B	47	Shaft	1	3021C
16	Gear	1	3025C	48	Nut	2	M20×1.5
17	Bearing	3		49	Pin	1	5×25
18	Cover	3	3017B	50	Bushing	1	3020E
19	Cover	2	3044B	51	Fascia	1	3060B
20	Oil seal	2	3046B	52	Oil seal	1	3071D
21	Washer	1	3045B	53	Cover	1	3059D
22	Shaft	1	3033B	54	Cover	1	3042C
23	Gear	1	3029B	55	Oil seal	1	3070C
24	Gear	1	3031B	56	Gear box	1	3001D
25	Gear	1	3032B	57	Screw	6	M6×12
26	Gear	1	3003B	58	Pin	2	5×25
27	Washer	1	3030B	59	Spring washer	2	
28	Gear	1	3002B	60	Screw	2	M10×30
29	Gear	1	3026C	61	Screw	1	M6×10
30	Gear	1	3007C	62	Washer	1	6×32×5
31	Washer	1	3008C	63	Bushing	1	3024C
32	Circlip	2		64	Gear	1	3016C

NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
65	Screw	1	M6×16	97	Pad	2	3048D
66	Shaft	1	3015C	98	Bulb	2	3052D
67	Oil seal	1	22×2.65	99	Oil seal	2	8.5×1.8
68	Gear	1	3014C	100	Shaft	2	3056D
69	Cover	1	3022F	101	Pin	2	3079D
70	Oil seal	1	3086D	102	Spring	2	
71	Screw	5	M6×25	103	Ball	4	
72	Shaft	1	3013D	104	Spring	4	1×5×14
73	Oil seal	1		105	Screw	4	M8×5
74	Screw	2	M16×1.5	106	Pin	2	M5×25
75	Washer	1		107	Pin	2	5×25
76	Oil seal	1	16×2.4	108	Hand lever	2	3055D
77	Screw	1	3012C	109	Pin	4	A6×20
78	Oil window	1		110	Pin	2	A5×15
79	Bracket	1	3011D	111	Screw	4	M4×6
80	Screw	1		112	Shifter	3	3062B
81	Screw	4	M22×24	113	Spring	2	1×5×14
82	Screw	2	M4×10	114	Shifter arm	1	3058D
83	Circlip	8		115	Shifter arm	1	3053D
84	Shifter arm	1	3063D	116	Tag	1	3064D
85	Shifter	1	3049B	117	Tag	1	3069D
86	Cover	1	3061B	118	Handle	2	2058
87	Shifter arm	1	3065D	119	Knob	2	M8×40
88	Jacket	2	3050D	120	Switch rod	1	3011D
89	Transparent scale	4	3080D	121	Screw	1	M6×10
90	Screw	6	M4×10	122	Position block	1	3012E
91	Key	4	5×6	123	Bearing	1	8103
92	Oil seal	2	21.5×1.8	124	Pin	1	5×40
93	Turn plate	2	3057D	125	Connection part	1	3020D
94	Tag	1	3071D	126	Ball	2	Ø6
95	Channel plate	2	3054D	127	Spring	2	1×5×20
96	Tag	1	3074D	128	Screw	2	M8×8

GEAR BOX-III

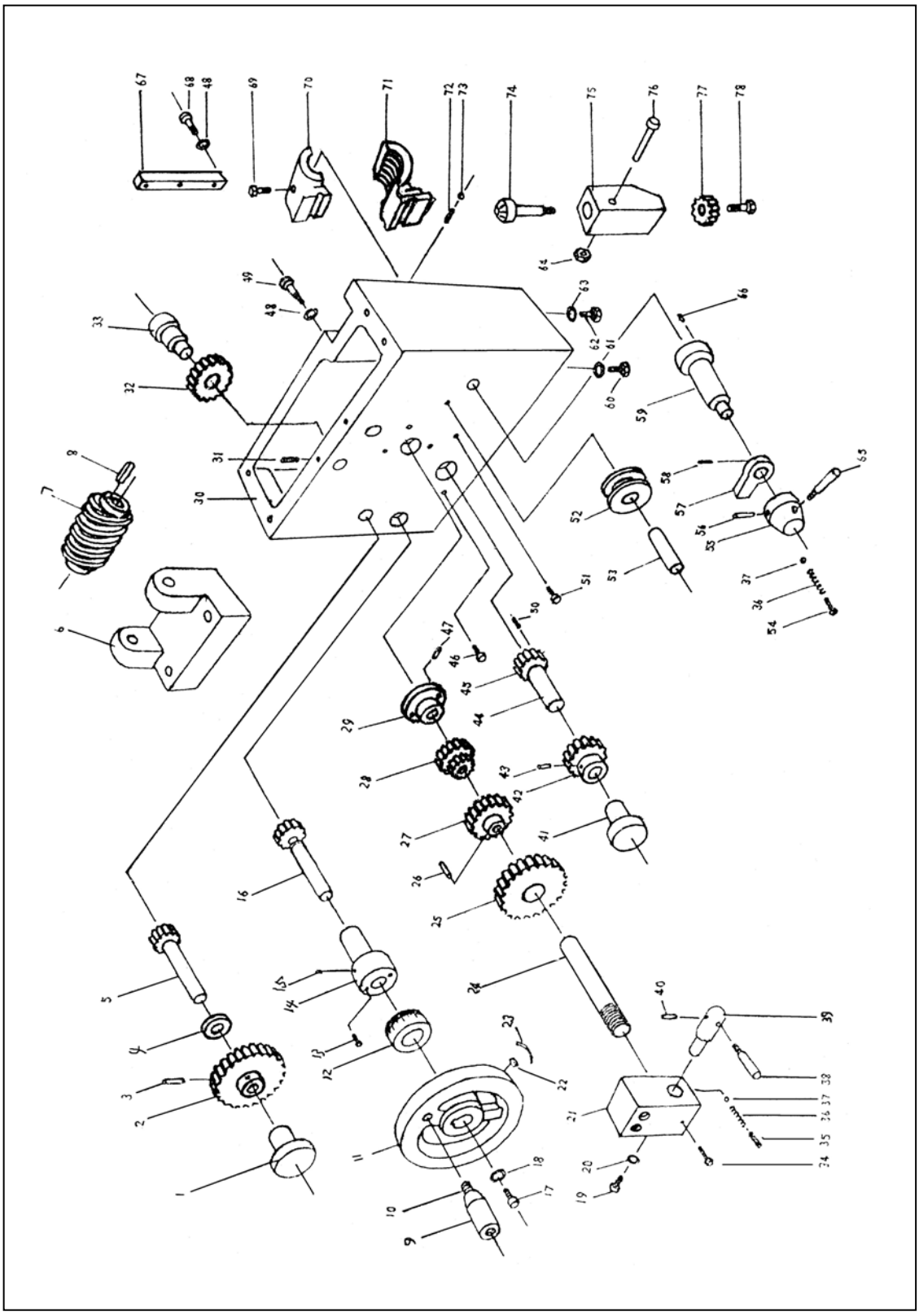


GEAR BOX- III

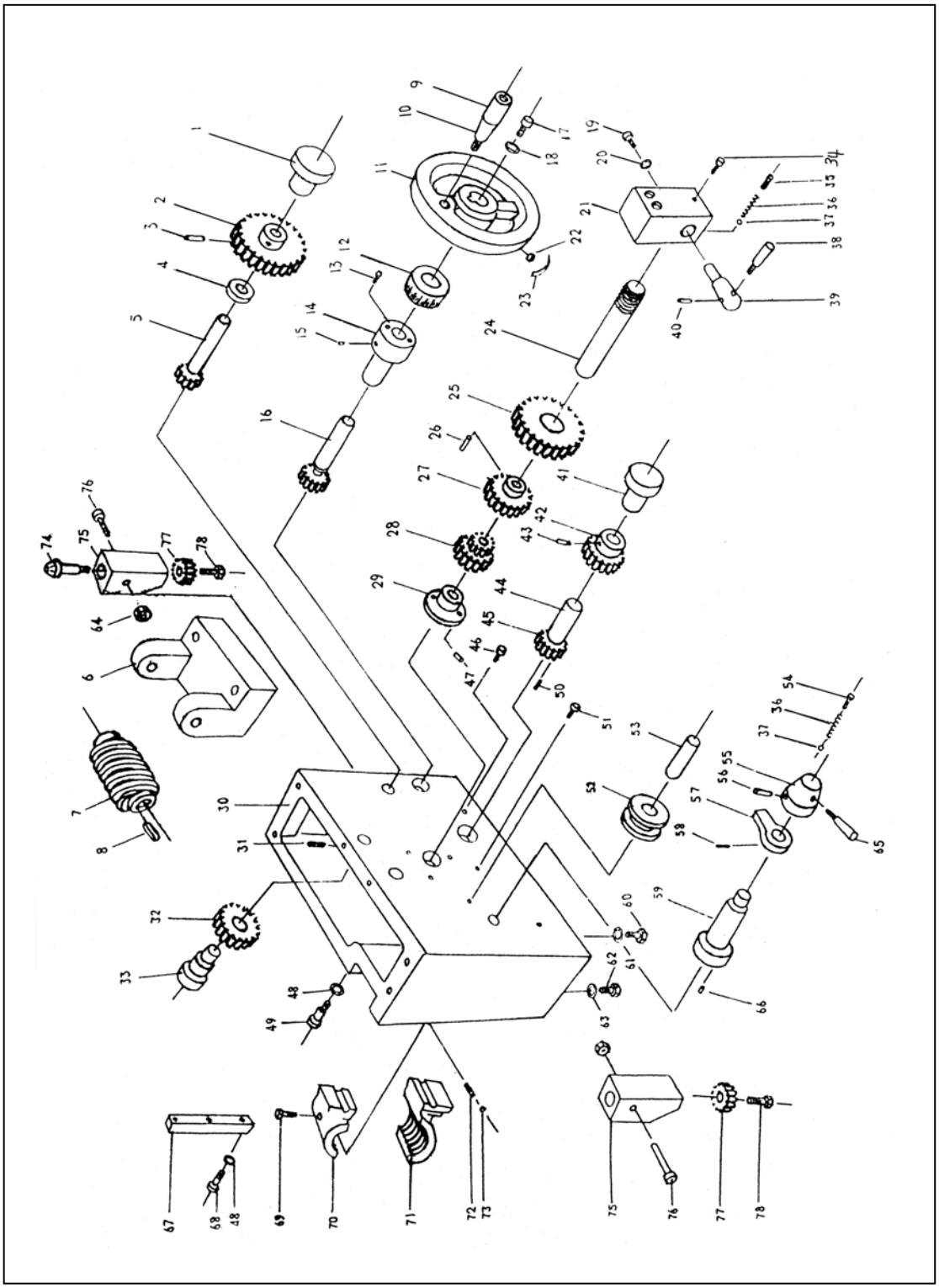
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Oil cup	1		26	Gear	1	3003B
2	Screw	7	M6×12	27	Washer	1	3030B
3	Cover	1	3034B	28	Gear	1	3002B
4	Oil seal	1	3035C	29	Gear	1	3026C
5	Bearing	8	89103	30	Gear	1	3007C
6	Key	1	5×13	31	Washer	1	3008C
7	Shaft	1	3041B	32	Circlip	2	
8	Key	3	6×90	33	Bearing	1	89103
9	Gear	2	3005B	34	Gear	1	3009B
10	Washer	2	3066B	35	Key	1	C5×40
11	Screw	1	M6×8	36	Shaft	1	3019C
12	Gear	1	3027C	37	Shaft	1	3004B
13	Key	1	6×15	38	Key	1	5×35
14	Key	1	6×35	39	Circlip	1	
15	Shaft	1	3067B	40	Gear	1	3006C
16	Gear	1	3025C	41	Pin	2	5×6
17	Bearing	3	89102	42	Gear	1	3018C
18	Cover	3	3017B	43	Bearing	1	8103
19	Cover	2	3044B	44	Cover	1	3084D
20	Oil seal	2	3046B	45	Oil seal	1	3068D
21	Washer	1	3045B	46	Bearing	1	8104
22	Shaft	1	3033B	47	Shaft	1	3021C
23	Gear	1	3029B	48	Nut	2	M20×1.5
24	Gear	1	3031B	49	Pin	1	5×6
25	Gear	1	3032B	50	Bushing	1	3020E

NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
51	Fascia	1	3060E	76	Screw	8	M8×15
52	Oil seal	1	3071D	77	Screw	1	M6×10
53	Cover	1	3059D	78	Position piece	1	3012D
54	Cover	1	3042C	79	Support	1	7003B
55	Oil seal	1	3070C	80	Screw	2	M4×20
56	Gear box	1	3001C	81	Shaft	1	3011D
57	Screw	6	M6×12	82	Gear rack	1	3050C
58	Pin	2	5×25	83	Gear rack	2	3049C
59	Spring washer	2		84	Shaft	2	3089A
60	Screw	2	M10×30	85	Oil seal	4	12×1.8
61	Screw	1	M6×12	86	Screw	2	M4×6
62	Washer	1	6×32×5	87	Gear rack	1	3062C
63	Bushing	1	B1260	88	Screw	12	M3×6
64	Gear	1	3016C	89	Sign board	4	2060
65	Screw	1	M6×16	90	Screw	4	M8×6
66	Shaft	1	3015C	91	Spring	4	1×5×25
67	Oil seal	1	22×2.65	92	Steel ball	4	Ø5
68	Gear	1	3014C	93	Screw	4	M6×10
69	Cover	1	3022F	94	Washer	4	
70	Oil seal	1	3086D	95	Hand wheel	4	3054F
71	Screw	5	M6×25	96	Key	4	5×8
72	Shaft	1	3013E	97	Gear	4	3088
73	Oil seal	1	18×30×10	98	Oil window	1	A12
74	Screw	2	M16×1.5	99	Oil seal	4	16×2.4
75	Washer	2					

APRON-LEFT



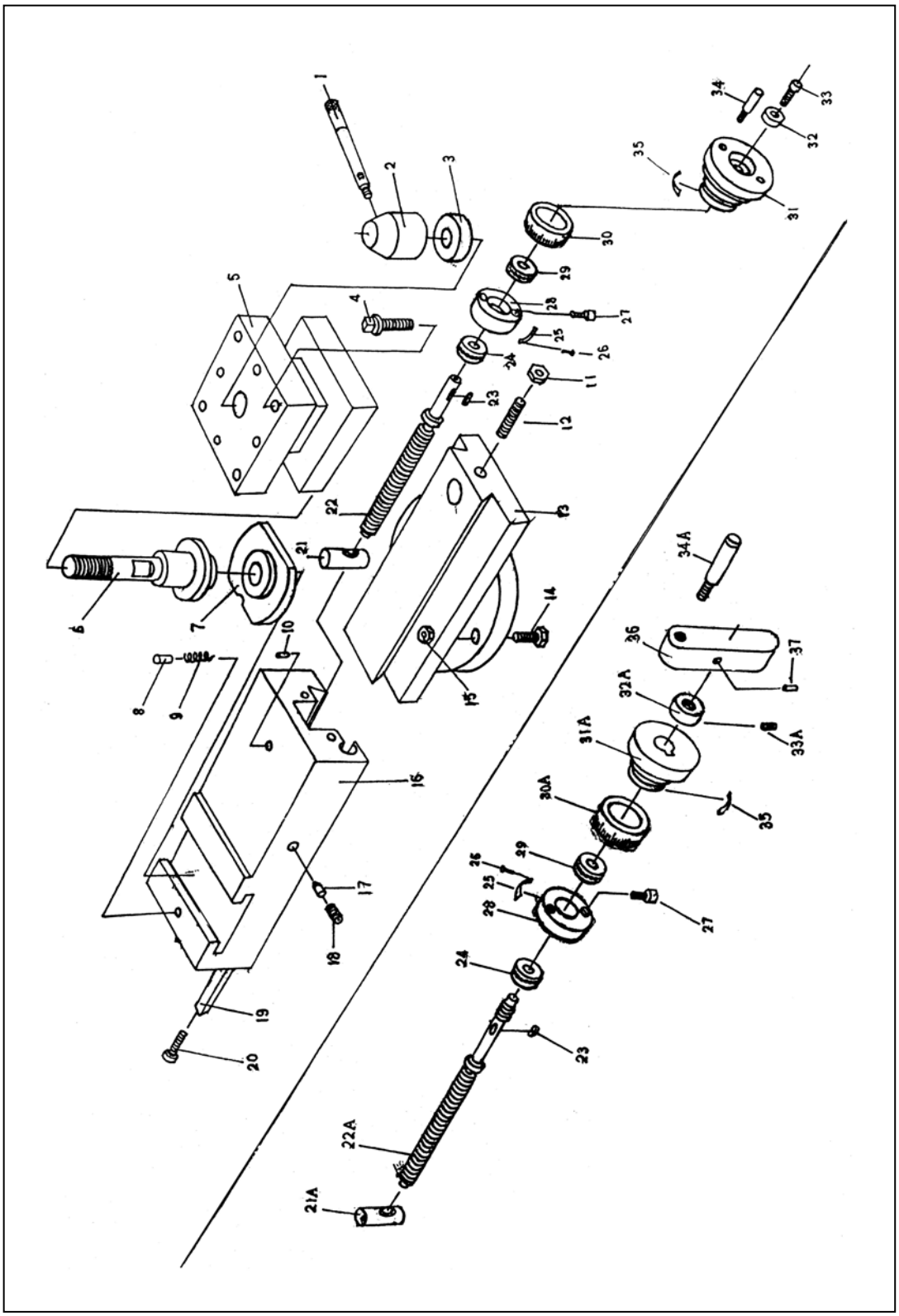
APRON-RIGHT



APRON-LEFT OR APRON-RIGHT							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Bushing	1	4026	23	Leaf spring	1	4037
2	Gear	1	4029	24	Shaft	1	4015
3	Pin	1	5×30	25	Gear	1	4012
4	Space	1	4027	26	Pin	1	5×33
5	Gear shaft	1	4028	27	Gear	1	4013
6	Worm am	1	4008	28	Gear	1	4014
7	Worm	1	4009	29	Bushing	1	4016
8	Flat key	1	B5×36	30	Apron case	1	4001
9	Handle	1	4032	31	Screw	1	M6×6
10	Lever	1	4033	32	Gear	1	4010
11	Hand wheel	1	4034	33	Shaft	1	4011
12	Index ring	1	4036	34	Screw	3	M6×45
13	Screw	1	M6×20	35	Screw	1	M8×8
14	Bracket	2	4031	36	Spring	2	1×45×6
15	Oil cup	1		37	Ball	2	
16	Gear shaft	4	4030	38	Lever	1	4041
17	Screw	1	M6×12	39	Gear shaft	1	4042
18	Washer	1	4035	40	Pin	1	5×25
19	Screw	4	M6×10	41	Bushing	1	4020
20	Washer	1	4038	42	Gear	1	4019
21	Boss	1	4039	43	Pin	1	5×25
22	Key	1	5×16	44	Shaft	1	4018

NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
45	Worm gear	1	4017	67	Gib	1	3022
46	Oil window	1	A12	68	Half nut house	2	M6×25
47	Screw	2	M5×33	69	Screw	2	M5×35
48	Washer	3	Ø6	70	half nut	1	4002
49	Screw	1	M6×10	71	Screw	1	4003A1
50	Screw	1	M6×6	72	Screw	2	M6×15
51	Limit block	1	4043	73	Nut	2	M6
52	Safety shifter	2	4025	74	Thread dial	1	4006
53	Shaft	1	4024	75	Housing	1	4005
54	Screw	1	M8×8	76	Screw	1	M6×65
55	Boss	1	4045	77	Gear	1	4044
56	Pin	1	5×40	78	Screw	1	M6×15
57	Cam	1	4021				
58	Screw	1	M5×12				
59	Shaft	1	4023				
60	Screw	1	M8×30				
61	Washer	2	Ø8				
62	Screw	2	M10×1×20				
63	Washer	1	Ø10				
64	Lever	1	4007				
65	Lever	1	4044				
66	Pin	2	5×10				

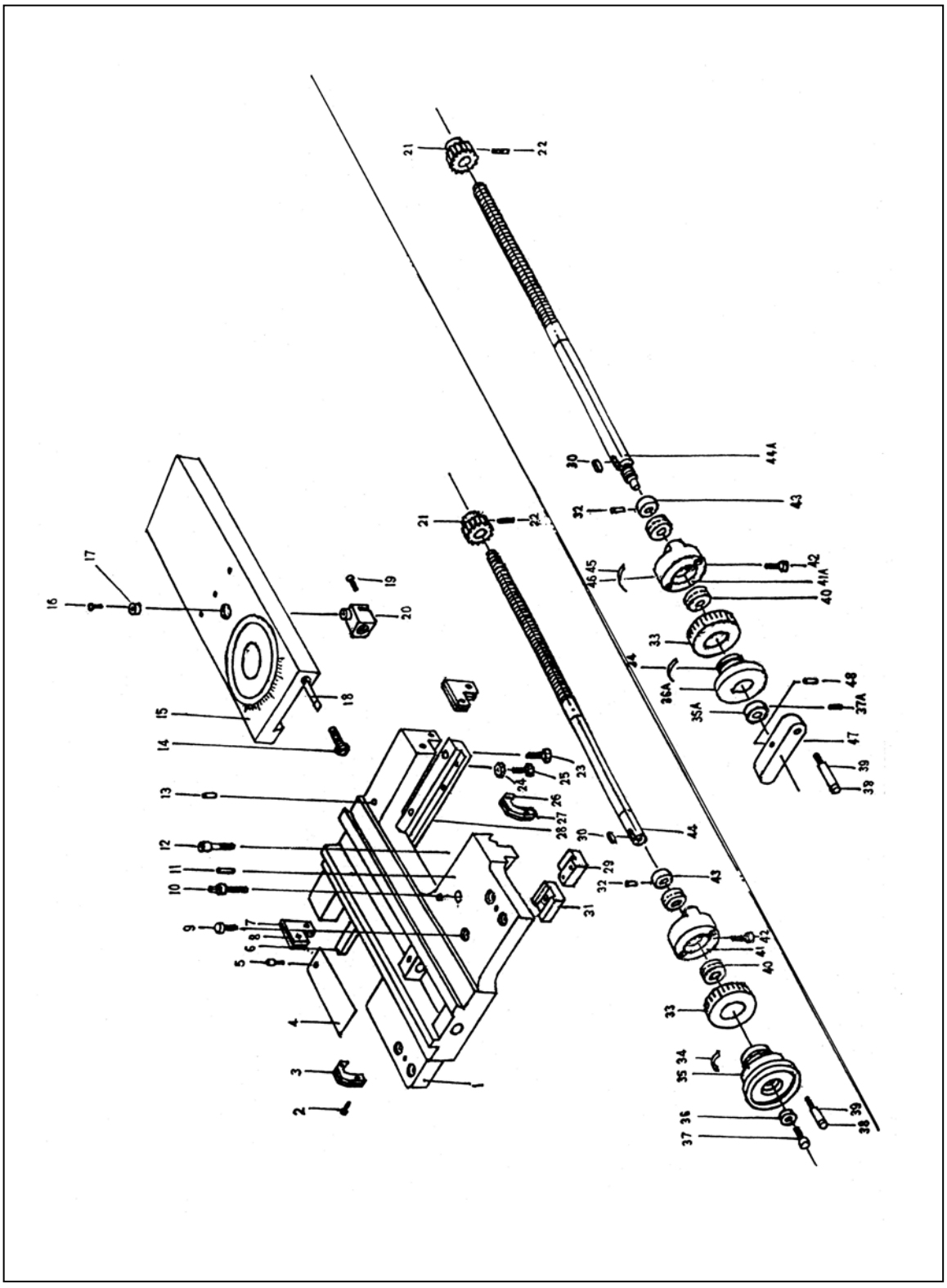
COMPOUND REST



COMPOUND REST

NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Handle	1	5010	23	Key	1	4×8
2	Boss	1	5009	24	Bearing	1	8101
3	Collar	1	5008	25	Scale	1	5026A2
4	Screw	8	M10×45	26	Rivet	2	2×4
5	Tool post	1	5005	27	Screw	2	M6×25
6	Shaft	1	5006	28	Bracket	1	5013
7	Nut	1	5003	29	Bearing	1	8101
8	Pin	1	5004	30	Index ring	1	5014A3
9	Spring	1	1.2×4.8×8	31	Hand wheel	1	5016A
10	Oil cup	1		32	Washer	1	5028
11	Nut	1	M6	33	Screw	1	M6×12
12	Screw	1	M6×16	34	Lever	2	5031
13	Compound	1	5001	35	Leaf spring	1	4037
14	Screw	2	5107	21A	Nut	1	5012
15	Nut	2	M10	22A	Guide screw	1	5011
16	Compound	1	5002	30A	Index ring	1	5014
17	Pin	1	5024	31A	Washer	1	5016
18	Screw	1	M6×8	32A	Nut	1	5025
19	Gib	1	5023	33A	Screw	1	M6×8
20	Screw	2	5021	34A	Lever	1	M8×63
21	Nut	1	5012A1	36	Bracket	1	5120
22	Guide screw	1	5011A3	37	Pin	1	3×16

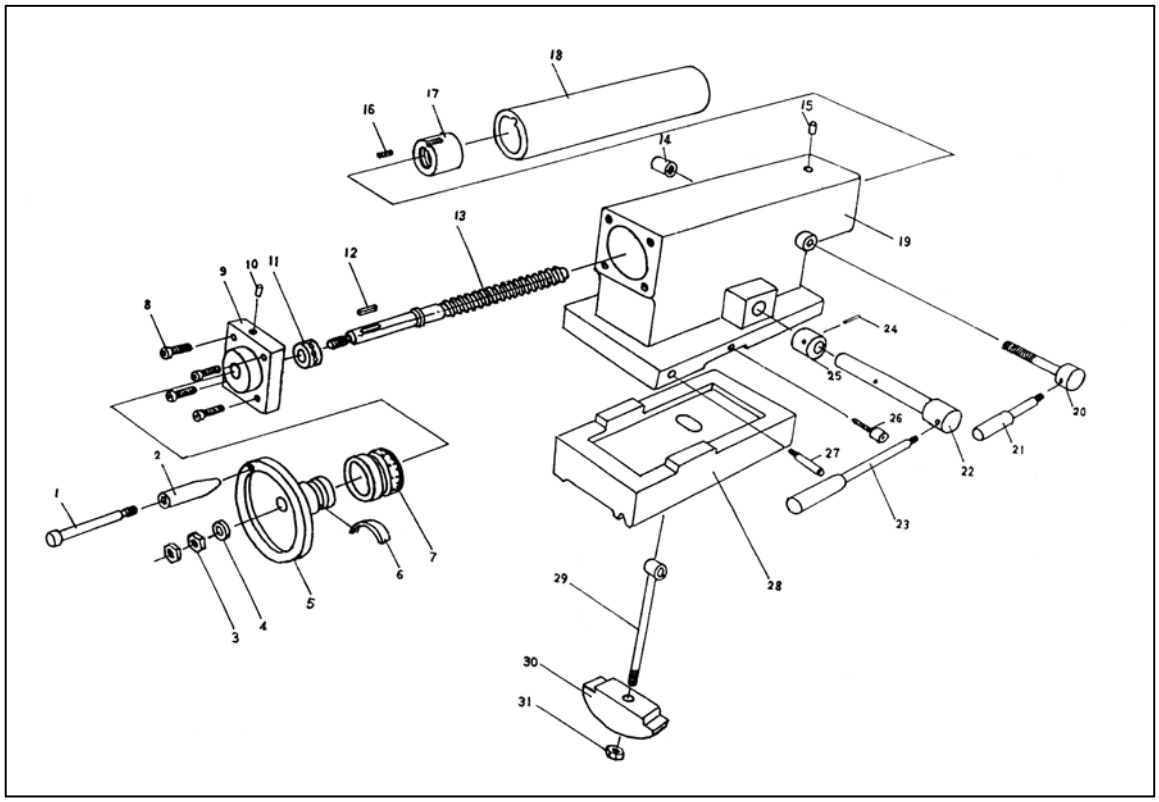
SADDLE



SADDLE

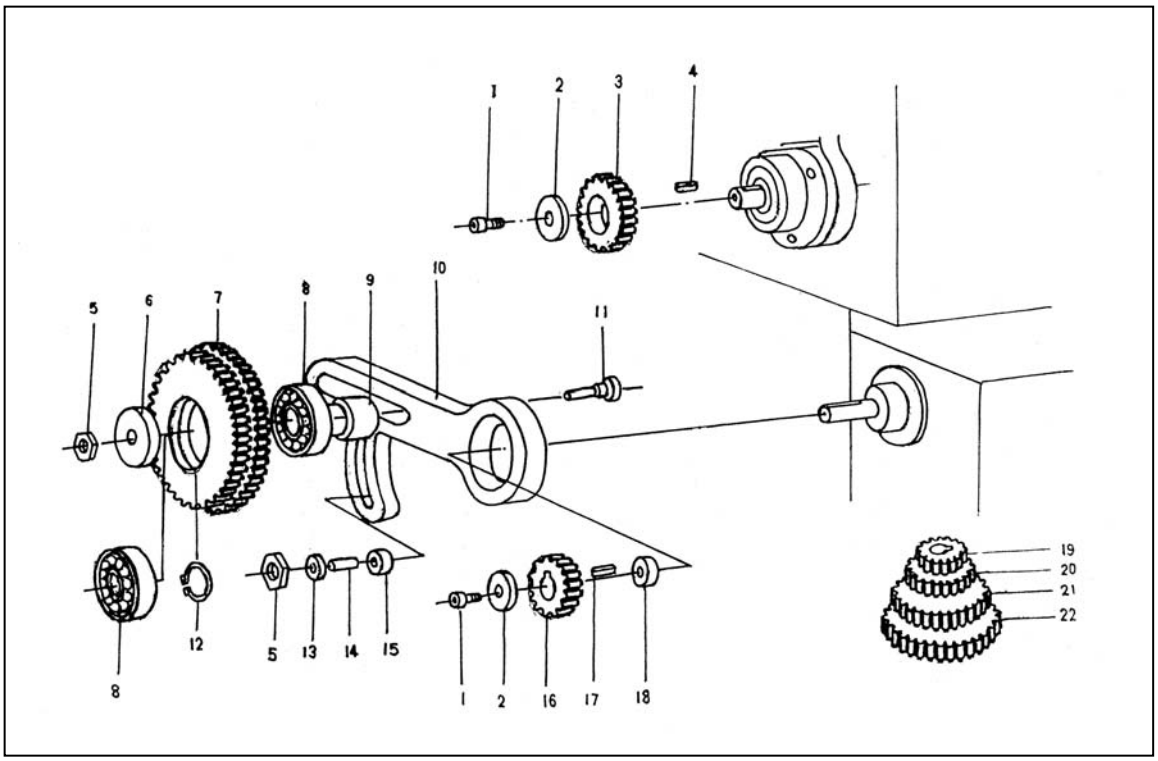
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Saddle	1	5101	28	Press plate	1	5131
2	Screw	8	M5×132	29	Press plate	2	5116
3	Wipper	1	5108	30	Key	1	5×20
4	Cover	1	5106	31	Press plate	1	5129
5	Screw	1	M3×8	32	Pin	1	3×20
6	Press plate	2	5130	33	Index ring	1	5124A3
7	Press plate	2	5110	34	Leaf spring	1	4037
8	Wipper	2	5109	35	Hand wheel	1	5122A
9	Screw	1	5113	36	Washer	1	5028
10	Screw	1	5128	37	Screw	1	M6×16
11	Pin	2	6×45	38	Hand	1	4033
12	Screw	4	M10×30	39	Lever	1	4032
13	Oil cup	5		40	Bearing	1	8102
14	Screw	2	5115	41	Bracket	1	5125A
15	Tool post	1	5102	42	Screw	2	M8×30
16	Screw	1	M6×12	43	Washer	1	5126
17	Bushing	1	5105	44	Guide screw	1	5103A3
18	Gib	1	5114	35A	Collar	1	5122
19	Screw	2	M4×12	36A	Nut	1	5121
20	Nut	1	5104A2	37A	Screw	1	M6×6
21	Gear	1	5127	41A	Bracket	1	5125A
22	Screw	1	M6×8	44A	Guide screw	1	5103A2
23	Screw	7	M8×25	45	Rivet	2	2×4
24	Nut	4	M8	46	Scale	1	5133A2
25	Screw	4	M8×25	47	Bracket	1	5120
26	Press plate	2	5112	48	Pin	1	4×20
27	Wipper	1	5111				

TAIL STOCK



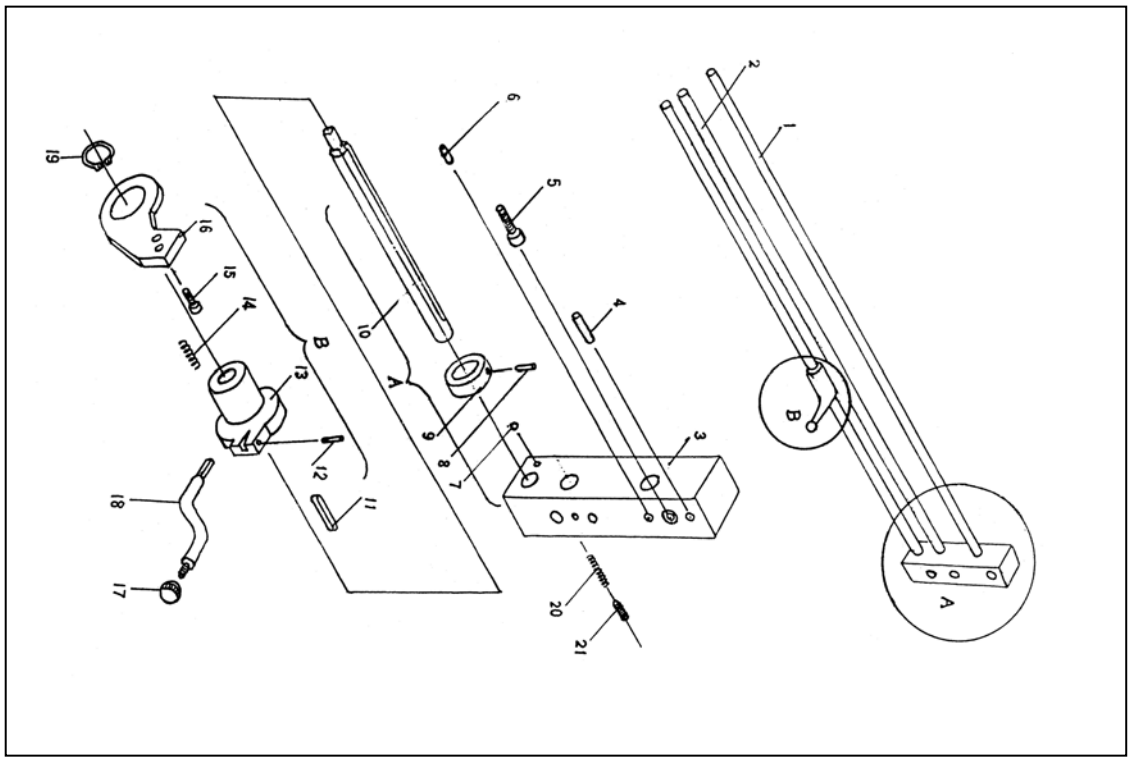
TAILSTOCK							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Handle	1	4033	17	Nut	1	6012
2	Lever	1	4032	18	Quill	1	6013
3	Nut	2	M10	19	Tail stock	1	6001
4	Washer	1	A10	20	Lock screw	1	6022
5	Hand wheel	1	6005	21	Handle	1	6021
6	Leaf spring	1	4037	22	Shaft	1	6017
7	Index ring	2	6010	23	Handle	1	6004
8	Screw	4	M6×16	24	Pin	1	5×30
9	Bracket	1	6011	25	Collar	1	6018
10	Oil cup	1		26	Screw	1	M10×50
11	Bearing	1		27	Screw	1	6003
12	Key	1	4×15	28	Base	1	6002
13	Guide screw	1	6006	29	Shaft	1	6019
14	Lock nut	1	6023	30	Base shoe black	1	6020
15	Oil cup	1		31	Nut	1	M12
16	Screw	2	M6×8				

CHANGE GEAR



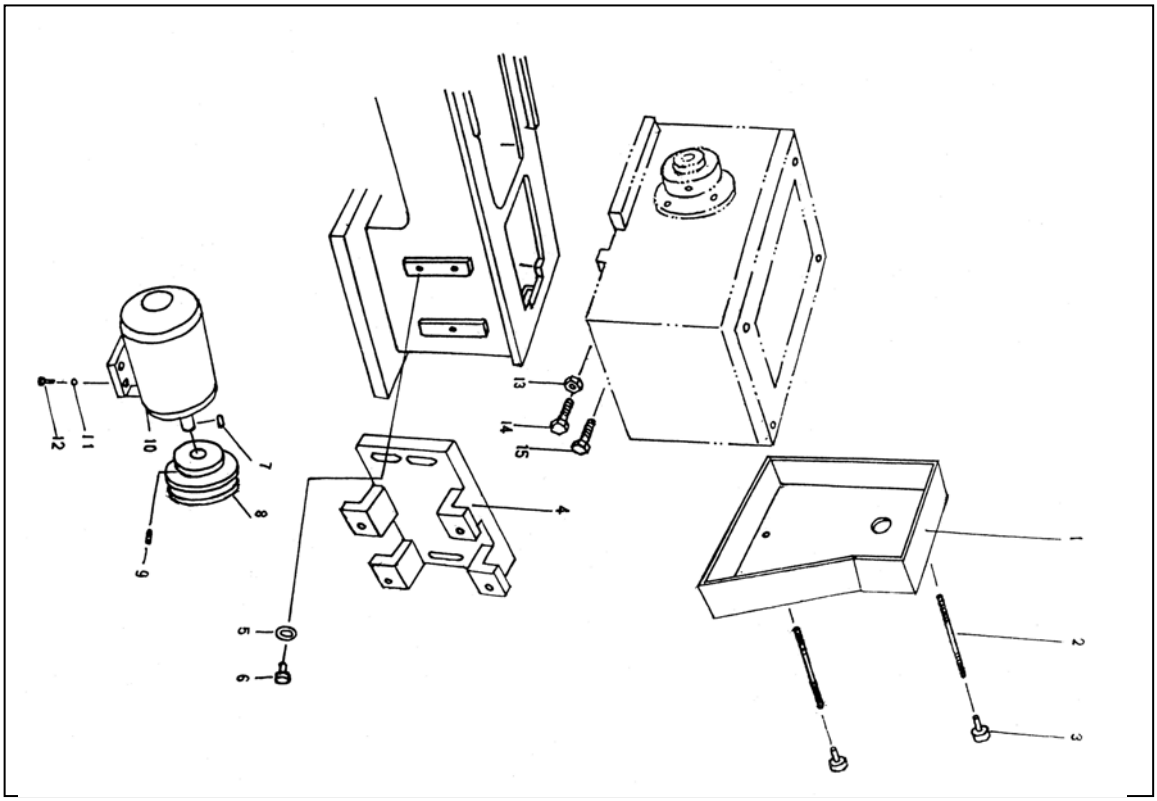
CHANGE GEAR							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Screw	2	M6×12	12	Circlip	1	
2	Washer	2	2003	13	Washer	1	
3	Gear	1	2002C	14	Screw	1	M10×45
4	Key	1	C5×8	15	Washer	1	3037A
5	Nut	2	M10	16	Gear	1	3039C
6	Washer	1	3035	17	Key	1	5×18
7	Gear	1	3038C	18	Washer	1	3034B
8	Bearing	1		19	Change gear	1	3076C
9	Collar	1	3033	20	Change gear	1	3075C
10	Quadrant	1	3043B	21	Change gear	1	3077C
11	Screw	1	3034	22	Change gear	1	3078C

CONTROL SWITCH ASSEMBLY



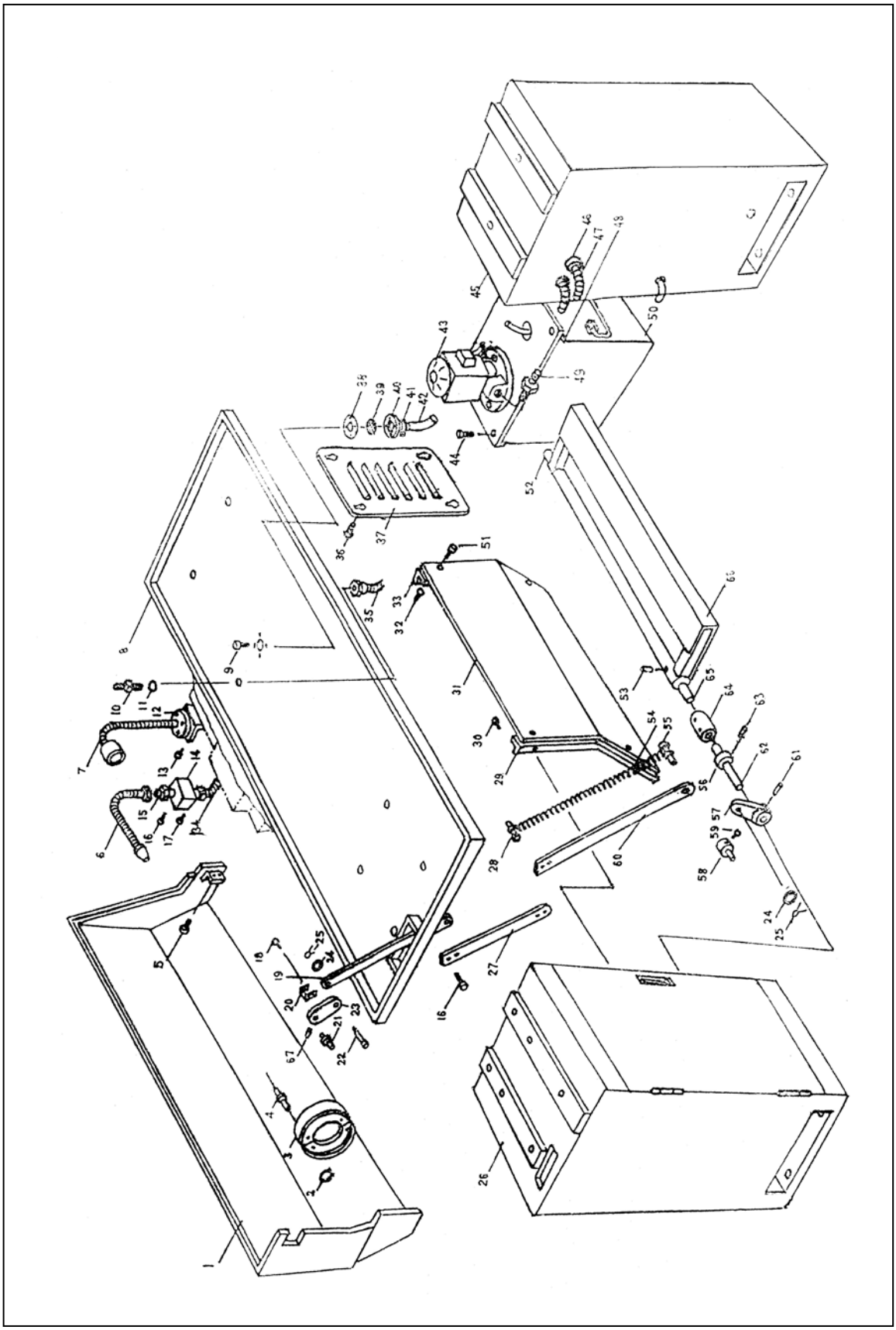
CONTROL SWITCH ASSEMBLY							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Guide screw	1	1005B	12	Pin	1	4×20
2	Rod	1	1006B	13	Bracket	1	1014B
3	Bracket	1	1012	14	Spring	1	1.2×8.10
4	Pin	2	6×65	15	Screw	2	M6×15
5	Screw	2	M8×60	16	Bracket	1	1015B
6	Oil cup	2		17	Handle ball	1	M10×32
7	Ball	1		18	Handle	1	1016
8	Pin	1	4×20	19	Circlip	1	
9	Bushing	1	1035B	20	Spring	1	1×5×30
10	Feed rod	1	1010	21	Screw	1	M8×10
11	Key	1					

BED AND DRIVE ASSEMBLY



BED AND DRIVE ASSEMBLY							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Cover	1	1021	9	Screw	1	M6×8
2	Screw	2	1002	10	Motor	1	
3	Nut	2	1001	11	Spacer	4	Ø8
4	Trestle	1	1024	12	Screw	4	
5	Washer	3	1013	13	Nut	2	M6
6	Screw	3		14	Screw	2	M8×45
7	Key	1	8×40	15	Screw	2	M8×30
8	Pulley	1	1003A5				

SPECIAL ACCESSORIES



SPECIAL ACCESSORIES--BASE PART

NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Chip guard	1	1023	31	Back plate	1	8601
5	Screw	4	M6×16	32	Nut	4	M6
8	Oil pan	1	1022	33	Right bracket	1	8603
26	Left cabinet	1	8400	45	Right cabinet	1	8500
29	Left bracket	1	8602	51	Screw	4	M6×16
30	Screw	4	M6×16				

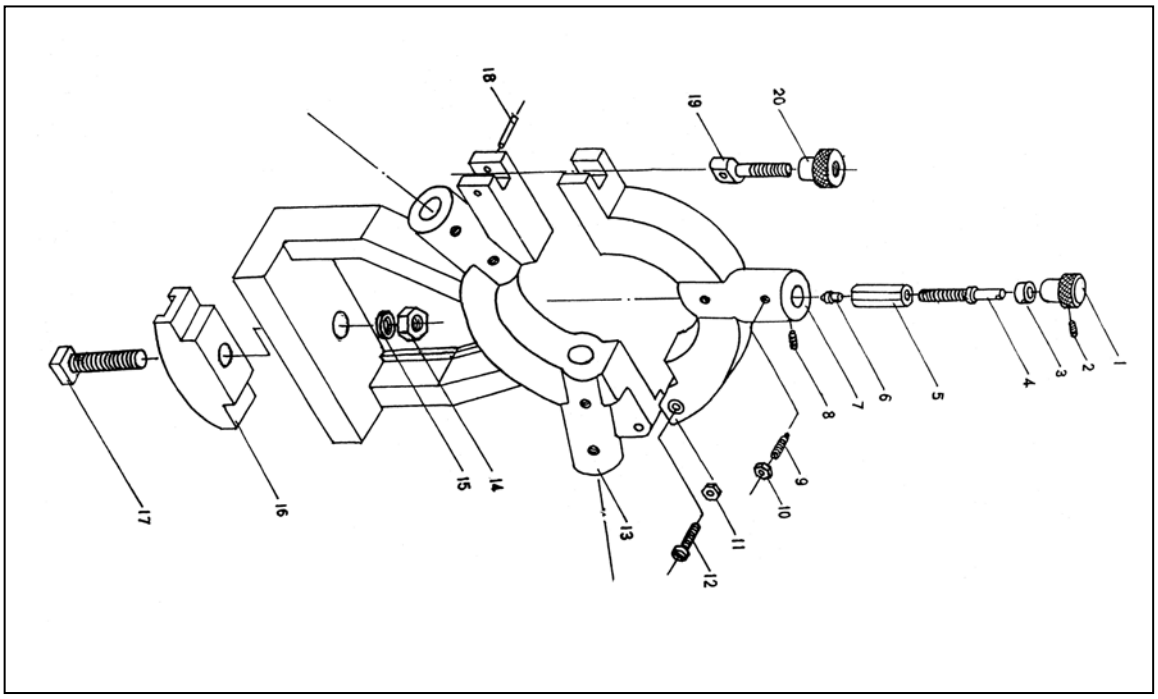
SPECIAL ACCESSORIES--BRAKE PART

NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
2	Open circlip	1		53	Spring pin	1	5×25
3	Brake block	1		54	Spring	1	1048
4	Shaft	1	1040	55	Shaft	1	1047
16	Screw	2	M6×12	56	Circlip	1	20
18	Screw	1	M4×10	57	Shifter	1	1045
19	Draw rod	1	1043	58	Shaft	1	1052
20	Bracket	1	1053	59	Screw	1	M6×30
21	Pivot	1	1042	60	Draw rod	1	1054
22	Pin	1	8×20	61	Spring pin	1	5×40
23	Shifter	1	1041	62	Shaft	1	1049-1
24	Washer	2		63	Screw	1	M6×12
25	Open clip	2	2.5×16	64	Connecting sleeve	1	1049-3
27	Draw rod	1	1044	65	Shaft	1	1049-2
28	Screw	1	M10×30	66	Paddle	1	1050
52	Shaft	1	1051	67	Spring pin	1	4×25

SPECIAL ACCESSORIES--COOLING PART							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
6	Coolant pipe	1		39	Filter	1	9203
9	Screw	4	M5×12	40	Pipe	1	9204
10	Pipe connecting	1	9206	41	Hooping	1	
11	Washer	1	9207	42	Pine	1	16×1000
14	Bracket	1	9208	43	Coolant	1	
15	Shaft	1	X6121-06011 A	44	Screw	4	M5×10
17	Screw	2	M8×35	46	Pipe	1	M16×15
34	Coolant pipe	1		47	Metal pipe	1	8×1800
35	Coolant pipe	1		48	Cover	1	9210
36	Screw	4	M6×12	49	Pipe	1	9206
37	Cover	1	9201A	50	Coolant box	1	9209
38	Papet lining	1	9205				

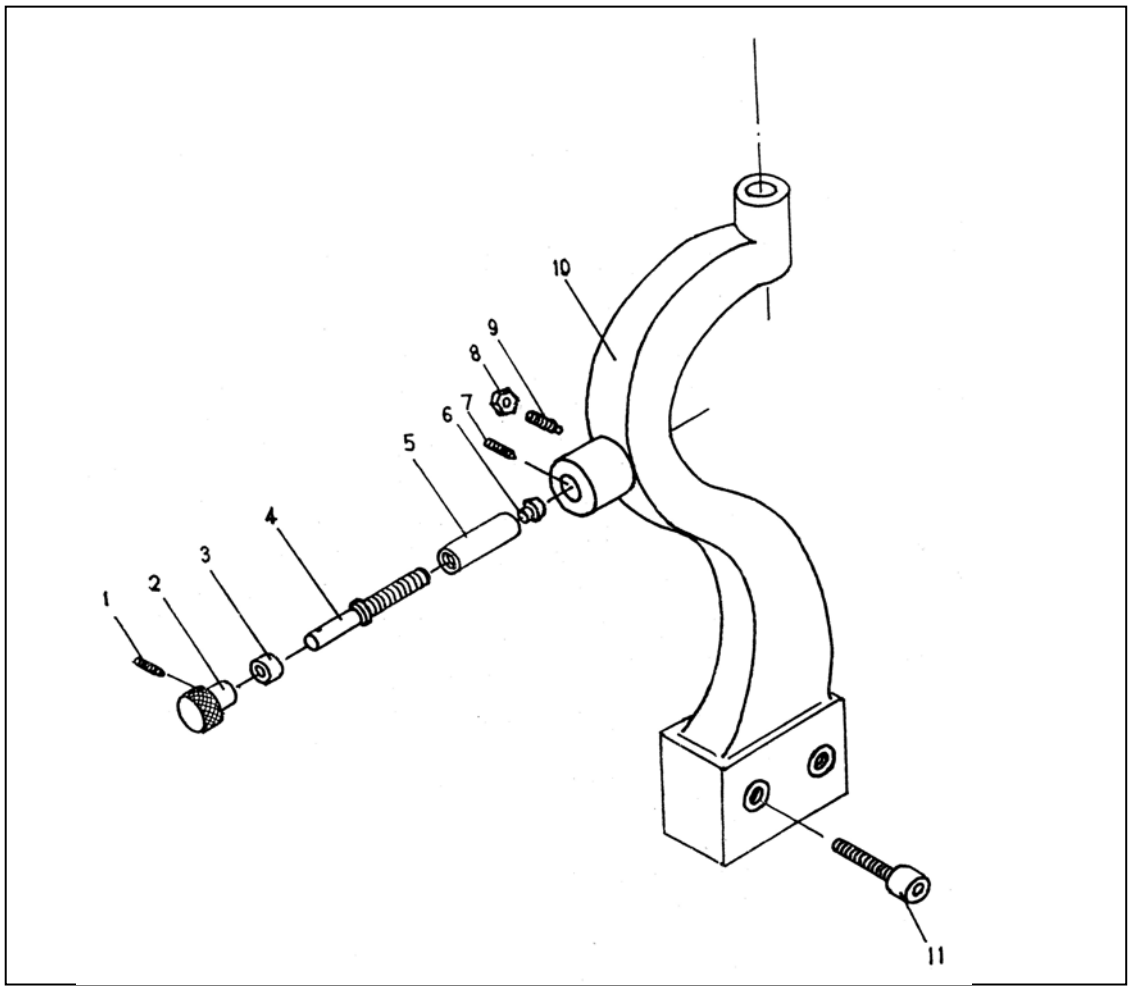
SPECIAL ACCESSORIES--LIGHTING PART							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
7	Working lamp	1		13	Screw	2	M5×12
12	Bracket	1	7015				

STEADY REST



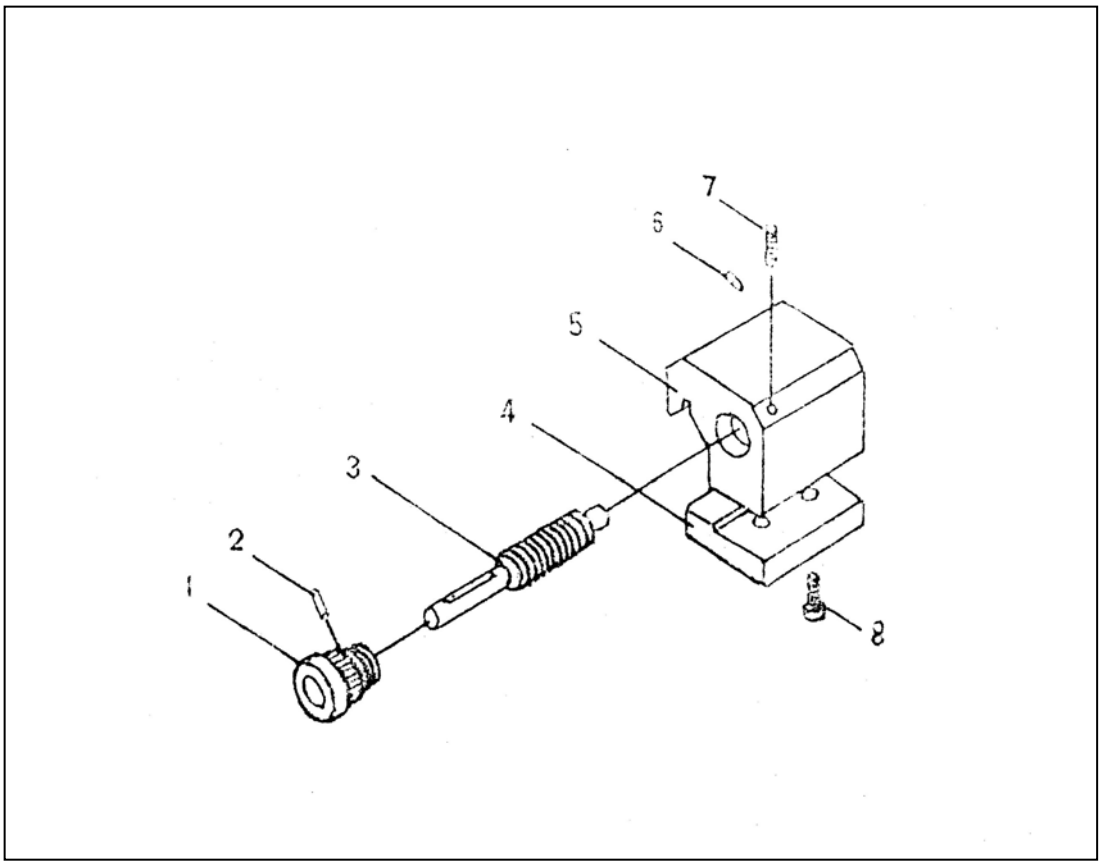
STEADY REST							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Knob	3	8205	11	Hex screw nut	1	M6
2	Screw	3	M6×8	12	Screw	1	M6×25
3	Collar	3	8207	13	Base body	1	8201
4	Pressing lever	3	8206	14	Hex screw nut	1	M12
5	Pressing collar	3	8208	15	Washer	1	12
6	Pressing base	3	8209	16	Pressing plate	1	6020
7	Upper body	1	8202	17	Square ad bolt	1	M12×60
8	Screw	3	M6×10	18	Spring pin	1	4×25
9	Screw	3	M6×16	19	Locking lever	1	8203
10	Hex screw nut	3	M6	20	Locking screw nut	1	8204

FOLLOW REST



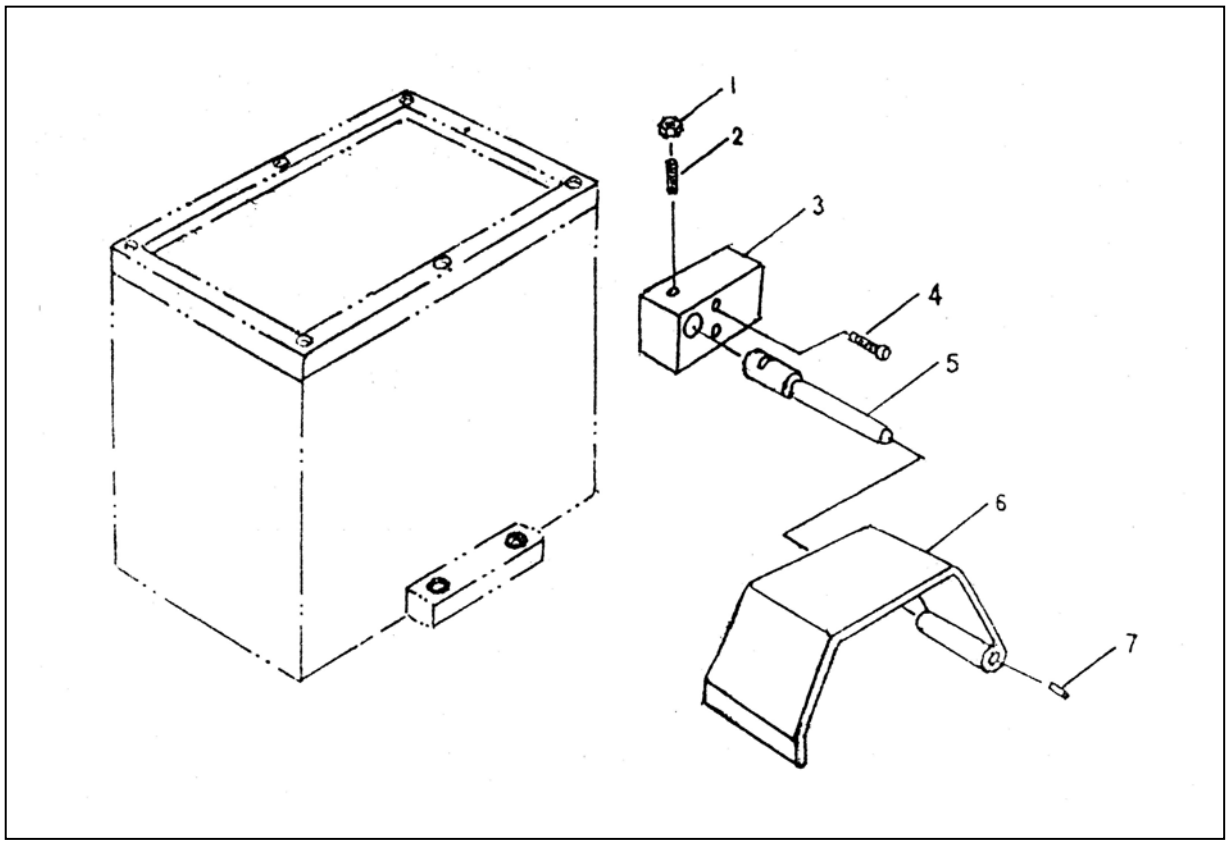
FOLLOW REST							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Screw	2	M6×6	7	Screw	2	M6×10
2	Knob	2	8205	8	Hex screw nut	2	M6
3	Collar	2	8207	9	Screw	2	M6×16
4	Pressing lever	2	8206	10	Body	1	8201
5	Pressing collar	2	8208	11	Bolt	2	M8×40
6	Pressing base	2	8209				

POSITION DEVICE



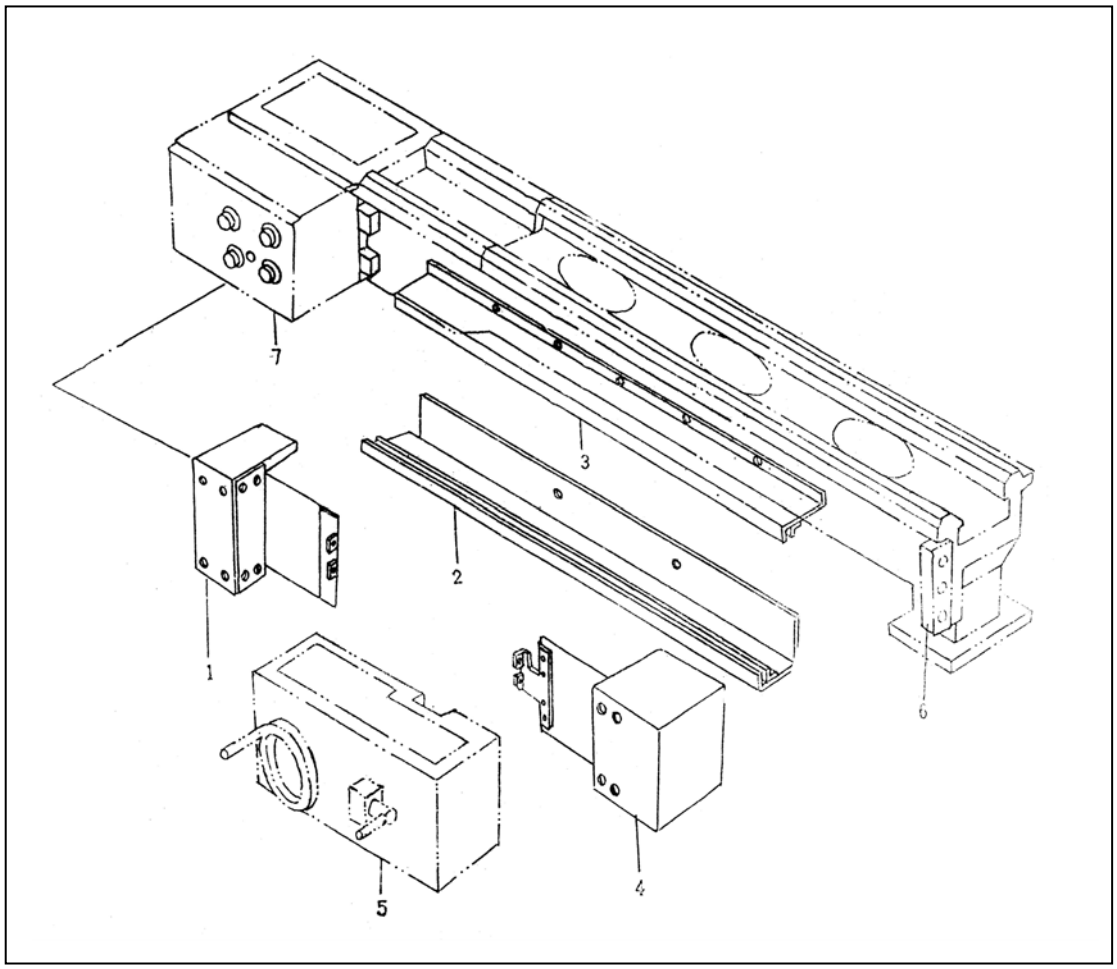
POSITIONING DEVICE							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Knob	1	8705	5	Body	1	8703
2	Pin	1	M3×6	6	Indictor	1	8707
3	Guide screw	1	8706	7	Screw	1	M6×10
4	Pressing plate	1	8704	8	Screw	2	M6×12

PROTECTING COVER



PROTECTING COVER							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Nut	1	M6	5	Shaft	1	8902
2	Screw	1	M6 ×16	6	Protecting cover	1	8903
3	Switch box	1	8901	7	Pin	1	M4 ×12
4	Screw	2	M6× 45				

GUARD



GUARD							
NO.	NAME	QTY	NOTE	NO.	NAME	QTY	NOTE
1	Left box	1	1120	5	Apron	1	4000
2	Down board	1	1118	6	Bracket	1	1012
3	Up board	1	1117	7	Gear Box	1	3000
4	Right box	1	1110				

Please dispose of packaging for the product in a responsible manner. It is suitable for recycling. Help to protect the environment, take the packaging to the local recycling centre and place into the appropriate recycling bin.

Only for EU countries

Do not dispose of electric tools together with household waste material. In observance of European Directive 2002/96/EC on waste electrical and electronic equipment and itsimplementation in accordance with national law, electric tools that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

Axminster Tool Centre,
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axminster.co.uk